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T R E A T I S E  
ON THE  
DISORDERS AND DEFORMITIES  
OF THE  
TEETH AND GUMS,  
EXPLAINING  
THE MOST RATIONAL METHODS OF TREATING THEIR DISEASES.  
ILLUSTRATED WITH CASES AND EXPERIMENTS.

BY THOMAS BERDMORE,

MEMBER OF THE SURGEONS' COMPANY AND DENTIST TO HIS MAJESTY.

Dente quid horridius nigro, quid pulchrius albo?

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XI

18/6

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## P R E F A C E

TO THE AMERICAN EDITION.

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ALTHOUGH since the time of the publication of the Treatise which we now offer to our readers, (1770,) the science of Dental Surgery has made great advances, we nevertheless think it a work well worthy of a place in the Library part of our Journal. Mr. Berdmore, during the period of his professional career, ranked deservedly high as a Dentist. No English practitioner, in this department of the curative art, at this time, enjoyed as high a reputation for skill and professional knowledge, and although his work has been scarcely noticed by subsequent writers, it is unequalled, in point of merit, by any previous British publication ; and in thus rescuing it, as it were, almost from oblivion, we believe we shall receive the thanks of our brethren generally. We had at first intended to append notes to it, descriptive of the present established principles and practice of the art, but upon reflection we came to the conclusion, that, inasmuch as that if we were to do this, the annotations would be more copious than the text, it would be as well to publish it as it is, without comments. The work, therefore, is principally valuable only as a book of reference. It is not offered as a practical guide to the student.

EDITORS AMER. JOUR. OF DENTAL SCIENCE.



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## P R E F A C E .

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WHEN first I resolved to devote my whole time and attention to that part of Surgery which concerns the Dentist's art, I observed, with regret, that no material instructions were to be derived from the writers of this country who have touched on the subject; therefore I endeavored, for my own improvement, to collect carefully, from my predecessors in business, and from practice, whatever I thought conducive to the advancement of it.

After a few years thus employed, I found, or I thought I had found, my observations and discoveries in some measure worthy of being communicated to those who practice in this business, to the parents who are solicitous for the health and beauty of their children, and to the patients who are affected with disorders or deformities of the teeth. I therefore endeavored to reduce them to some order, and at last resolved to commit them to the press.

The work being originally designed for artists, *who are not much given to reading*, and for patients who do not love too much trouble, I purposely avoided quotations. Indeed, without departing from the subject, I could only have quoted a few French authors, who have written *to make their names known*, and one or two English, who have translated very injudiciously.



A

## TREATISE ON THE TEETH.

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### PART I.

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#### CHAPTER I.

##### *The Design of this Treatise.*

To preserve the teeth, to regulate their growth, and to remove the vast variety of disorders and deformities to which they are exposed, are matters of greater importance than is generally imagined, and of such universal concern as justly claims the attention of the public; for disorders or deficiencies of the teeth, however slightly regarded by some people, are inevitably attended with evils which affect the whole system; and deformities of them are often remarkably hurtful in common life.

Whatever renders mastication painful or imperfect, not only lessens our relish and enjoyment of food, but also prevents that perfect comminution and mixture of it with the salivary liquor, which is necessary towards digestion; and thence gives rise to an endless train of diseases of the stomach and bowels, at the same time that the body is deprived of its wonted nourishment.

Disorders of the teeth also frequently bring on the most excruciating pains and dangerous inflammations, sometimes deep seated abscesses, which destroy the neighboring parts, and affect the whole system by sympathy, or by infecting the blood with corrupted matter; and it is well known, that cutting the teeth carries off an immense number of children, who by due assistance might easily be saved.

Deformities of the teeth, as they generally tend to disease, are objects of serious attention; but setting apart a consideration which appears so distant, it is well known that they are often as formidable as disease itself.

In common life, we every day observe, how a slight deformity caricatures every gesture of some worthy people; whilst beauty and elegance soften the foibles of others, and grace the few accomplishments they are possessed of.

The oratory of the pulpit and the bar, and above all the art of pleasing in conversation and social life, are matters of the highest concern to individuals. But in these no one can excel whose loss of teeth, or rotten livid stumps, and fallen lips and hollow cheeks, destroy articulation, and the happy expression of the countenance; whose voice has lost its native tone, and whose laugh, instead of painting joy and merriment, expresses only defect and disease.

A foulness of the teeth is by some people as little regarded as it is easily removed; but with the fair sex, with the polite and elegant part of the world, it is looked on as a certain mark of nastiness and sloth; not only because it disfigures one of the greatest ornaments of the countenance, but also because the smell imparted to the breath by dirty rotting teeth, is generally disagreeable to the patients themselves, and sometimes extremely offensive to others in close conversation.

The *design* of this short treatise then, is to obviate and remove these evils; to render the art which I profess of more extensive utility; to communicate to the public the advances I have made in it; and lastly, to rescue it from the indifference and unmerited contempt with which it has hitherto been treated, by those especially who are pleased to comprehend under the idea of tooth-drawing or tooth-scraping all that is necessary to be known or advanced on the subject; and therefore place on an equal footing with the surgeon dentist, the tooth-drawing barber and itinerant mountebank.

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## CHAPTER II.

### *The Method of this Treatise.*

FOR the sake of brevity and precision, I shall divide this little work into three parts.

In the first, the teeth and the parts with which they are immediately connected, shall be considered and described in their natural and sound state.

In the second, I shall treat of the teeth and contiguous parts, in their diseased state, and annexed to each disease I shall give the methods of cure.

In the last part, I shall teach all the various means which prevent disorders of the teeth, and which have been found, by long experience, conducive to their soundness, regularity, good color, smoothness, and firmness in the sockets, and to the lasting preservation of them in old age.

This last part, although it will contain instructions for every age, I must beg leave to address particularly to the ladies who

have young children, and to the governesses who have the care of them, and who are studious to cultivate in them whatever is admired in society, and useful in itself.

For in the early periods of life, whilst the teeth are forcing a passage through the gums, and afterwards when the time of shedding approaches, it rests more with the mother and the nurse to make them good or bad than is generally imagined: then nature can be cherished where she is kind, assisted when feeble, and easily directed or restrained when irregular or luxuriant.

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### CHAPTER III.

#### *Anatomy and Physiology of the Teeth, and parts adjacent.*

A PERFECT knowledge of the structure of the teeth, and of the parts to which they are immediately connected, is the basis of all rational practice, as well in diseases as in superficial deformities of them.

I wish, therefore, for the sake of those who practise drawing, cleaning, and other operations on the teeth, that this necessary instruction could be imparted by writing: but that is impossible; for a regular study of anatomy, under proper professors, ocular demonstrations, and judicious dissections, often repeated, are absolutely necessary.

I would have it understood, therefore, that I do not attempt to teach the anatomy of the teeth in this manner; but that I mean only to give such a general idea of these parts in their natural and sound state, as to enable every person, however slightly conversant in these matters, to comprehend whatever shall be said hereafter concerning the disordered condition of them, and to determine, in some measure, how far the practice which I adopt, is rational, or likely to succeed.

The teeth, in grown people, are small bones, of various figures and sizes, fixed immovably in their sockets, by a species of articulation, by the anatomist called *gomphosis*.

That part of them which is sunk in the socket, is called the *root*; that which is exposed to view, the *body* or *crown*; and the circular ridge or line, which limits and distinguishes these two parts, is called the *neck* or *collar* of the tooth.

The *substance* of the teeth is extremely different from that of other bones, being denser, whiter, and not apparently laminated, nor subject to exfoliation.

The *body* of the tooth is crusted over with a very white, smooth polished substance, called *enamel*, which only extends as far as the *collar*, whatever some anatomists may have said to the con-

trary; it differs in many circumstances from the bony part underneath, as shall be related more at large hereafter, and it is so hard as to strike fire with steel like flint; viewed with a microscope, it appears to be composed of short radiated fibres, proceeding perpendicular to the plain or surface of the part from which they arise, and its thickness seldom exceeds half a line, or the twenty-fourth part of an inch.

This enamel is formed before the tooth appears above the gums; it thickens, hardens, and polishes, until the age of twenty or twenty-five, and afterwards is repaired no longer, but gradually wears by continued use.

The roots of the teeth consist of one uniform substance; they are only covered by a periosteum, or thin membrane, which follows them to the bottom of the sockets, and helps to connect them with the diploe, or spungy osseous substance, which forms the inside of each socket.

The *collar* of the tooth, all round, is firmly connected to the membrane of the gums, which, in this place, seems to unite with the periosteum above mentioned.

The *substance* of the *gums* is compact, elastic, and in some measure resembling the texture of leather; it is fixed to the jaw bones by means of their periosteum; it covers the whole alveolar border of both jaws; insinuates itself between the teeth; encompasses the collar of each, and is firmly connected with it. The gums, therefore, on the outer and inner sides of the teeth, are one continued piece, containing as many openings as there are teeth; and the membrane which covers them seems to be a continuation of that which goes to the lips, cheeks, and tongue.

The teeth, considering their size, are plentifully supplied with *nerves* and *blood-vessels*, which enter through a small hole at the points of their roots, and after passing through a straight channel as far as the crown, are divided and diffused all over their substance: this hole lessens as we advance in years, and at last is totally obliterated.

The *arteries* proceed from the internal carotids, the *veins* return to the jugulars, and the *nerves* are branches of the fifth pair.

The nerves of the upper and lower gums are branches of the maxillaris superior and inferior, which come from the fifth pair; they also receive branches from the portio dura of the auditory nerve, which inosculate with the former in a singular manner, and give rise to certain sympathetic affections related in the second part of this work.

The use of the gums is to support the teeth, to fill up their interstices to keep them firm, and to protect their roots from the injuries of external air, of the salivary liquor, and of acrid food.

The *number* of the teeth varies in different periods of life, as shall be shown hereafter; at present, we shall only consider them in their most perfect state.

After the *dentes sapientiæ* have appeared, there are sixteen teeth in each jaw, which are divided into three classes; the first including the four anterior teeth, called *incisores* or *cutting teeth*; the second including the two next, one on each side, called *canini* or *dog teeth*; and the third including the other ten, five on each side, named *molares* or *grinders*.

The incisors of the upper jaw are larger and broader than those of the lower; and of the upper ones, the two in the middle are the largest.

The *roots* of the incisors are long, pointed, and single; the *bodies* are wedge-like, convex on the outer side, a little concave within, flattened on the sides, and so disposed that their sharp edges lie all in a line, making one *uniform edge*.

The *dentes canini*, so called from their prominence and similitude to the teeth of dogs, and also *eye-teeth*, on account of their situation, stand on either side of the incisors.

Their *bodies* are thicker, more prominent, pointed, and rounder on the outside, than those of the incisors; and their roots are thicker, longer, and more pointed. Sometimes they are so long as to perforate the bottom of the maxillary sinus.

Of the *dentes molares*, or *grinders*, the two first in each row are small, the two next larger, as are the last also, called the *wise-teeth*.

Their *bodies* are generally short, very thick, irregularly cylindrical, or rather with four sides a little rounded, and terminated by a broad end, more or less filled with obtuse points, cut in some measure like so many diamonds; whence the name of crown is most frequently given to the bodies of the molares, because the resemblance is greater than in the others.

The crowns of the two small molares are often less than the bodies of the canini, and seldom have above two points, or three at most.

In the two large molares the crown is of much greater extent, and the points are three, four, and often five in number.

The fifth grinder, or *dens sapientiæ*, has a crown much like the two former, but often more rounded and with fewer points. We sometimes find it, even in advanced age, wholly hid in its socket.

The *roots* of the molares are long, more or less flattened, single in some of them, in others two, three, or four, but rarely five in number. Sometimes all these roots are distinct, sometimes wholly united, and often united only in part. They are generally straight, and more distant from each other at the extremity than

at the neck of the tooth, because they taper to a point; but in some instances these points are bent inwards, outwards, and in other directions.

The roots of the *small grinders* often appear single, without being so in reality; for, on examining them narrowly, we find they have two roots united, or as it were soldered together. Sometimes the only distinction that appears consists in a slight separation at the point.

The *great molares* have several roots; in the upper jaw three or four, but in the lower jaw only two in general.

The fifth molaris, or *dens sapientiae*, has often only one root, but more commonly two, which are conical and seldom long; thence it happens that this tooth is generally lost in old age before any of the other grinders.

It appears then, that the grinding teeth of the upper jaw have more roots than those of the lower; and in mastication, or when the mouth is shut, the upper row, especially in the fore part, advances beyond and slides over the lower, instead of meeting it. In some people, however, they do meet, but seldom fail, in that case, to destroy each other, or to be worn down very early in life by their constant rubbing and pressure.

It is perhaps unnecessary to add, that the teeth serve for mastication, for the distinct articulation of sounds and for ornament.

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#### CHAPTER IV.

##### *The Formation, Growth, and Shedding of the Teeth.*

IN dissecting the alveolar arch of either jaw-bone, in infants newly born, we observe, in each socket, a collection of soft, white, glairy matter, contained in a small membranous sack, pierced on that side which corresponds with the bottom of the socket, by a nervous and vascular cord, whose vessels presently divide, and are branched all over the membrane and contained substance.

This is the tooth in *embryo*, whose future nourishment, growth, and ossification is to be derived from the matter conveyed by these vessels.

The first sprouting of the teeth through the gums happens sooner or later, according to the health or vigor of the child, and is called the *first dentition*.

It begins in the second, third, fourth, fifth, or sixth month after birth, is seldom finished before the second or third year, and proceeds in the following order, pretty nearly.

Within the first three or six months, appears one of the front incisors of the lower jaw; then, after a little time, the other; a

few months afterwards the great incisors of the upper jaw come forth, both nearly at the same time; then come the two lateral incisors of the lower jaw, and the two small ones of the upper one, in some little time after the other; then appear the two canini of both jaws; and in some months more, or about the second year, the small molares shoot forth successively: so that at the end of the second year, in general, a child is furnished with ten teeth in each jaw, which are called *milk-teeth*.

The *second dentition* is in the sixth or seventh year, or thereabouts, and produces the four first great dentes molares, one at either extremity of both jaws.

The *third dentition* happens in the tenth, twelfth, fourteenth, or fifteenth year, and furnishes four other great molares, one close by each of the former.

Finally, about the twentieth year, and in some people long after, comes the *last dentition*, which gives the four extreme dentes molares, called dentes sapientiæ, from their coming after puberty.

It is to be observed, however, that this order varies considerably in different people and different constitutions. Instances are recorded of children born with their teeth already cut; others, particularly those who are ricketty, do not cut their teeth before the fifteenth month or later; and we every day observe that the dentes sapientiæ in some people come very late, or never come at all. Some have more than the ordinary number of teeth in one row, others have the supernumerary ones in a double row, or standing apart without any order, owing to a circumstance which we shall touch on hereafter.

The first twenty teeth, or *milk-teeth* mentioned above, generally last till the sixth or seventh year; after that, until the fourteenth or fifteenth year, they fall successively, and are succeeded by others, most commonly without any considerable pain, and almost in the same order which they observed in coming forth at first.

The *shedding* of the teeth is wisely intended, and brought about in a singular manner. Their extremely hard enamel, and the rigidity, of their bony substance, will not admit of distension and free growth, like other parts of the body. After an enlargement of the jaw-bone, the original teeth are no longer sufficient to fill up the extended alveolar space; they must stand single and unsupported by each other, and leave interstices remarkably hurtful to mastication, to speech, and the symmetry of the countenance; the enamel also is not regenerated when once lost, and that coat, which was given in infancy, would be too slender for the uses of long life.

Nature, therefore, has kindly placed under the milk-teeth the

stamina of another set, which, in due time, acquires a greater size and *solidity* than the former, and by their constant pressure on the roots of the milk-teeth, rob them of their nourishment and hold, and finally push them entirely out of the sockets.

Hence, in children of two or three years, we find ten grown teeth in each jaw, ten stamina under them, and also the stamina of the six molares which come forth afterwards.

Before we conclude this part, I think it necessary to relate an observation, which, although unsupported by the evidence of any other writer, I am convinced is perfectly true, and applicable to good purposes in practice; that is, the molares of the second dentition are considerably smaller than the milk-molares to which they have succeeded, notwithstanding the increased size of the jaw-bones; therefore, what we have said above of the increased size of the teeth, applies only to the incisors and canini.

## PART II.

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### *Of Diseases of the Teeth and Gums.*

To treat minutely of all the diseases of the teeth, and to follow them through all the varieties and subdivisions which occur in practice, would alone furnish matter for a large volume, and the method would be equally tiresome and unprofitable to the reader.

I shall therefore rank them under general heads, placing together all those which agree pretty nearly in their general symptoms and indications of cure.

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### CHAPTER I.

#### *Of the Tooth-ache.*

OF all the diseases to which the human body is exposed, the tooth-ache is perhaps the most frequent, and the most commonly mistaken as to its causes and methods of cure; because the disorders that give rise to it are extremely numerous; because they are not easily detected or traced; and because the people who are generally applied to on this occasion are very ignorant. For taking out the tooth, which the patient complains of, is their universal cure, without considering that the pain may often be removed by gentler methods, or that it may arise from disorders which never fail to be exasperated by such treatment, or that it may be owing to *sympathy*, which I have often observed to produce a sensation of exquisite pain in the sound tooth on one side, whilst a rotten one on the other was the sole cause. Nay, sometimes, a cariated tooth has produced violent pain in the corresponding one of the opposite jaw.

Indeed, the tooth-ache cannot be treated with any certainty of success, unless we trace the causes of it, and pay close attention to them in the cure; for, although in its progress it often becomes a violent disease, producing inflammations, restlessness at night, head-aches, glandular swellings, hysterick fits, delirium, abortions, fevers, and a variety of dangerous diseases; yet, in its rise, it is merely a symptom of disease in the teeth, gums, periosteum, or sockets, the removal of which will remove the tooth-ache of course.

Whether we consider it as a violent disease, or as a *troublesome symptom*, we are necessarily involved in the investigation and removal of its causes, as much as in the pursuit of means to alleviate or suppress the pain for the instant; and hence it happens that the *tooth-ache* cannot be treated apart from the *disorders* which usually produce it, without omitting what should be chiefly insisted on, or without giving rise to endless repetitions, prolixity, and confusion.

We shall, therefore, in this place, only enumerate the various disorders which occasion the tooth-ache, leaving the diagnostic and curative part to be more fully considered under each head respectively.

1. A tooth-ache often arises from *defluxions* falling on the gums, the neighboring periosteum, and bone, particularly after catching cold.
2. From *obstruction* or *inflammation* of the nerves and vascular parts of the tooth itself.
3. From *purulent* or *acrid matter*, generated in any of these parts, in consequence of inflammation, extravasation, or acrimony of the fluids.
4. From fungi, excrescences, and ulcers of the gums.
5. From a *recess* of the *gums*, occasioned by scorbutic, venereal, or putrid disorders, whereby the roots of the teeth are exposed to external air and injury.
6. From *tartar* of the teeth, extending itself along the roots, and injuring the gums.
7. From *looseness* of one or more teeth, occasioned by violence, loss of gums, salivation, or putrid disease.
8. From *injudicious extraction*, whereby the tooth is frequently broken low down, the gums are bruised and torn away, the neighboring teeth exposed at their roots, the external side of the socket very often considerably injured, and splinters raised which produce lasting pains and inflammation.
9. From sudden alternations of *heat* and *cold*.
10. From *sympathy* with the neighboring affected parts.
11. From *collections* of *matter* formed in the *maxillary sinuses*, and in the cancellated parts of the lower jaw.
12. From *caries* or *exostosis* of the bones which form the sockets.
13. From *caries* of the tooth itself.
14. From loss of *enamel*, whereby the sensible, irritable part of the tooth is exposed.
15. From a *fracture* of the tooth.
16. From *dentition*.
17. And lastly, from the affection called *tooth-edge*.

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## CHAPTER II.

### *Of Defluxions falling on the Gums, and the Tooth-ache arising therefrom.*

THE *lentor* of the fluids, the *spasmodic* affections of the solids, and the *tension* and *overcharge* of the vessels which are observed

to take place, in consequence of catching cold, are apt to generate obstructions and inflammation; and the tender parts which are most exposed to the influence of external air, generally suffer first. Hence, heaviness of the head, inflammation of the pituitary membrane, irritation and increased action of its glands, &c. hence, also, an uncommon tension and repletion of the vessels of the gums, periosteum, teeth, and neighboring glands, the increased flow of the saliva, and the sensation of pain on these occasions.

But those who have caught cold are not the only people that are subject to this disorder; for the same general causes, which produce extraordinary repletion and irritability in other parts, produce them here also; and it is observable that women who are not regular, and also women with child, are remarkably subject to a tooth-ache of this kind, for reasons easily deducible from what has been said above.

This sort of tooth-ache is distinguished from others, by observing that some of the general causes which we have just now mentioned have preceded; that a sense of fullness in the gums, and an uneasiness about the sockets of several teeth, have been succeeded by an uncommon flow of saliva, and a swelling of the gums, extending itself more or less to the muscles of the cheek and face, on the affected side; and lastly, that the pain is not confined so much to one tooth, as happens in other cases; or if it be that the tooth so affected appears perfectly sound.

This tooth-ache is extremely common in the winter season, and the *barbers* are indebted to it, beyond all others, for the plentiful supply of *beautiful sound* teeth, which it furnishes to *ornament* their windows and signs withal. For the people, distracted with pain, run to the first barber-dentist's shop that presents itself; and the operator instantly applies the *universal cure*, the instrument, without wasting time with observations and questions.

If this absurd practice were only attended with the loss of a sound tooth, it would not, perhaps, in the opinion of some people, deserve to be considered in a serious light; but that is not all. The extraction of a sound tooth, whilst the gums and periosteum are swelled and inflamed, is not performed without tearing and wounding them in such a manner as increases the evil, renews and exasperates the irritability, disposes the parts to inflammation, and uncovers the roots of the neighboring teeth, when they are most susceptible of pain, obstruction, and decay; and hence it appears that the loss of the neighboring teeth, which so constantly follows the extraction of a sound one, in defluxions, is occasioned by the *operation*, and not by any contagion, or communication of putrid matter, as pretended on these occasions.

The common method also of giving acrid, aromatic substances

to be chewed, such as ginger, galangal, Florēntine orris root, cloves, allspice, mace, camphor, orange peel, peppermint leaves, caraway seeds, and many other stimulating applications, in various forms, is often productive of very dangerous consequences, notwithstanding the discharge which they occasion. For it is to be considered that the liquor of the *salivary glands*, and not the contents of the *distended, obstructed vessels*, comes forth on this occasion ; and since there is no real direct evacuation of the latter, stimulating medicines, applied to the very seat of *inflammation*, to the distracted irritable fibres, must increase the repletion, tension, and pain.

The true and rational method of cure is comprehended under four general indications :

1. To lessen the velocity, quantity, and inflammatory disposition of the blood. 2. To relax the affected parts by topical applications, and sometimes by scarifications. 3. To make a revulsion by means of irritation, and by discharge from a neighboring part. 4. And lastly, to lessen the sensibility of the pained parts by the use of external and internal sedatives.

1. The first indication is answered by bleeding and purging, and frequent repetitions of nitrous draughts.

2. The second, by keeping the mouth constantly moistened with emollient, attenuating liquors, such as decoction of marshmallows, comfrey, or satirion roots, or of columbine, or quince seeds, with a little nitre ; by applying poultices of bread and milk to the affected cheek externally, and boiled or roasted figs internally, and also by scarification of the gums ; but this last should only be practised when the inflammation is very violent, and where the obstruction has lasted so long as to leave no hopes of resolution.

3. The third indication is most effectually answered by the use of blisters applied to the ears and nape of the neck, some are fond of sternutatories and leeches, but I think to little purpose.

4. For the last intention, opium is to be added pretty freely to the above mentioned emollient liquors, and given in due doses at night to procure rest.

Thus much it is the duty of a surgeon dentist to tell the patient, in general terms, to prevent his falling into ignorant or dishonest hands. But for the well timed and judicious application of such methods, a physician or surgeon should be consulted. For he who wanders beyond the *limits* of his profession, is subject to errors which never are forgotten ; or his advice, however judicious, fails of due respect, and always goes unrewarded.

In looking over my notes on this subject, I observe that defluxions, mixed with other diseases of the teeth and gums, are much

more frequent than cases of *simple defluxion*. But since the limits prescribed to this little work will not admit of many narratives of this kind, I must content myself with offering one case, which I take to be more instructive than any of the rest, on account of the frequency of its return, and the constant similarity and simplicity of its symptoms.

A married young woman, about twenty-one years of age, came to me in December, 1766, to have a tooth taken out. Her face was greatly swelled on the right side, as were also the parotid and submaxillary glands; and she could not, without great pain, open her mouth wide enough to give me an opportunity of examining it perfectly. Her teeth were remarkably white, regular, and sound, but the gums were swelled to a considerable degree, particularly on the affected side, and the saliva flowed into the mouth in much greater quantity than is usual in the natural state.

After having asked her some questions relating to her disorder, I found that she had been attacked with the same complaint three or four times before, and at very distant intervals.

She said it came on with a sense of heaviness and oppression in that part of the forehead which joins with the nose; then followed a *running* at the nose, which soon ceased, and was generally succeeded very quickly by an uneasiness of the gums, a general pain of the teeth on that side, and a flow of limpid spittle. But the face and glands had never swelled to so great a degree as happened in the case before us, and therefore she was resolved to have a tooth drawn, to prevent the danger of any future complaints of the same kind.

Determined by the symptoms and progress of the disorder, and by the soundness of all the teeth, which I examined with the greatest care, I told her that the extraction of a tooth could not give any relief, that it could not prevent a return, that it would give excruciating pain, and might be attended with very dangerous consequences in the present inflamed state of the parts.

With a good deal of persuasion I prevailed on her to lay on a large blister to the nape of the neck, for she would not submit to the application of it behind the ear. I advised her to get from her apothecary a cooling purge, and to drink plentifully of water-gruel, with a little nitre.

As soon as ever the *blister* began to run, the pain abated, and in two days the swelling was almost entirely gone. In about ten days afterwards she gave me thanks; and as she never since has called, I presume she has not had any return.

## CHAPTER III.

*Of Obstructions and Inflammation of the Nerves and Vascular Parts of the Tooth and the Tooth-ache arising therefrom.*

THESE disorders of the nerve of the tooth are not easily discovered; and therefore, in tracing a tooth-ache of this kind, we are obliged to make use of negative, rather than positive signs.

It is certain that wherever there are vessels and nerves, *there* obstruction, inflammation, and pain may be seated. In very lasting pains of the teeth then, which can be referred to no other cause, which are not attended with the diagnostic signs which distinguish all the other disorders mentioned in this work, we may justly direct our inquiries to this hidden source, and rather assume a rational probable opinion, than act blindly without any opinion at all.

This species of tooth-ache is relieved by *counter-impression* and *sedatives*. Acrid masticatories, formed chiefly of the substances mentioned in page 18, are often of considerable service; for the irritation which they give to the neighboring soft parts, often diverts the mind from that of the disordered nerve; and perhaps the discharge occasioned by them directs the course of the fluids towards the glandular and superficial parts, instead of urging the affected nerve. *Burning* the ear with a hot iron has also been practised, under the notion of *counter impression*; and if we can credit authors, and some modern histories of this kind, with considerable success.\*

For my own part, I do not approve of such treatment. I know it is not often attended with success; and even where it is, the relief is only for a moment; for it is owing to the terror and agitation of mind naturally connected with the idea of burning, more than to any pretended connection of nerves; and I have, in my own practice, seen people relieved of pain on the appearance of the surgeon, and by the dread of the operation, as often as any man can pretend to have cured by the actual cautery, applied in such a manner. I would never advise, therefore, to amuse the patient with such a precarious experiment, whilst more rational and more effectual methods may be used; such as blisters laid on behind the ears, and to the nape of the neck, and sedatives used externally and internally. If these do not succeed, extraction is the last resource.

With respect to the virtues of the *loadstone*, and of certain

\* Since the publication of this Treatise, I have received such strong assurances, from different persons, of the efficacy of this application, that I can scarce doubt but that good effects may sometimes have arisen from it; and, in such cases as admit of any probability of success, perform the operation, as it is attended with no danger or bad consequences.

*charms and incantations*, so impudently affirmed by vagrant mountebanks and imposters, I hope the intelligent reader will readily join with me in treating them with contempt, and in pitying the poor people who are so easily and so grossly imposed on.

When the disordered condition of the nerves of a tooth has been of long duration, it frequently extends itself along the body of the great nerve into the substance of the diploe, and also to the nerves of the periosteum, which surround the root; and then the slightest motion of the tooth, or pressure, or the touch of a hard body, excites a sensation of pain. In this state the disorder is easily distinguished, and the instrument should not be used until the above-mentioned methods have been fairly and patiently tried. Although I have taken a good deal of pains to note down all that has occurred in my practice relative to such pains of the teeth as are not attended with any *visible* disorder of the teeth or gums, I must own, I am not yet certain that the cause is such as I have suggested, nor can I presume to say whether the cure, in any instance which has hitherto presented itself, should with most justice be attributed to the masticatories which I recommended, or to chance, or *nature only*. Therefore I shall not attempt to recite any cases of this kind, until I am better informed.

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#### CHAPTER IV.

##### *Of Acrid Matter, generated in the neighborhood of the Teeth, and the Tooth-ache arising therefrom.*

THE *gums, periosteum, and vessels* of the teeth and sockets, as they are subject to obstruction and inflammation, are necessarily affected sometimes with purulent matter, which by lying long on these parts, or on account of its peculiar acrimony in certain circumstances, irritates the nerves, affects the roots of the teeth, and produces lasting pain.

This disease is easily distinguished by the appearance of the purulent matter, by the separation of the gums from the teeth, which generally attends it, and by the disagreeable smell of the breath, which is often perceptible to the patient himself.

It is cured by making one or more incisions to the very bottom of the cavity in which the matter lodges, and by giving a free passage to it at the most depending part. The wound is to be frequently dressed with stimulating balsamics, such as balsam copaiba, or tincture of myrrh, received on a dossil of lint; and when it is almost healed, the mouth is to be washed four or five times a-day with some astringent gargle, such as the decoction of tormentil or bistort root, &c., to brace and strengthen the newly

generated gums. If the pain be considerable, solutions of opium and camphor should be added to the dressings, as well as to the astringent washes last mentioned.

The tooth so affected should never be drawn until a surgeon of proper judgment has declared his art ineffectual, because there is always the highest probability of cure without losing it; and without proper care and treatment, the same matter which occasioned the hasty extraction of one tooth, may continue to affect the neighboring ones in the same manner.

Children at the time of the second dentition, are more frequently affected with this disorder than other people; for the growing teeth sometimes meet such a resistance from the milk-teeth, which lie over them, as occasions inflammation, which often terminates in suppuration.

Some months ago I was called to see a child of nine years of age, who had been troubled for a fortnight, or three weeks, with what the attendants called a *tooth-ache*, attended with a swelling of the cheek, and some degree of fever. Upon examining his mouth, I found a considerable quantity of matter collected in a sinus, which ran from the external side of the small molares of the left side, almost down to the angle of the jaw. I opened it immediately with the common *gumfleam*, the pain soon abated, and with proper dressings I brought it to heal in less than a fortnight: from the same cause it happens sometimes, that the matter makes its way externally, when long neglected, and leaves unsightly scars, which never disappear.

When the imprudent use of mercury has produced violent inflammations and ulcerations of the gums, before the venereal infection has been expelled, the fetid putrid state of the fluids in these parts, joined with the venereal *poison*, renders the matter which oozes from them so acrid, that the slightest sores frequently extend themselves all over the gums, and sometimes go deep into the neighboring soft parts.

Such cases I have seen attended with very violent pains of the teeth; but as they belonged more properly to the surgeon, I have very rarely interfered in the cure.

But of all disorders, the scurvy is the most destructive to the teeth and gums; for it not only brings on ulcerations of the soft parts, but also attacks the membranous lining of the sockets, destroys the nerves at bottom, and deprives the teeth of nourishment; in consequence of which they become discolored and loose.

Cases of this kind occur every day; and it is to be observed, that although simple ulcers of the gums may be cured by the treatment above-mentioned, here it will avail nothing; for the pain cannot be removed by curing the external ulcers, whilst the

chief source of the disease lies out of reach ; nor can any applications to the gums fasten the teeth or remove the pain, whilst corrupted matter surrounds their roots and preys upon the sockets.

In this case, therefore, it is necessary to take out the loose teeth ; and the *operator* will always find that their roots are evidently covered with the corrupted matter, which rendered the extraction advisable and necessary.

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## CHAPTER V.

### *Of Fungi, Excrescences, and Ulcers of the Gums, and the Tooth-ache arising therefrom.*

A tooth-ache arising from fungi, excrescences, and ulcers of the gums is easily distinguished, as the cause is external, and obvious to every person in the least acquainted with surgery, or even the natural state of the parts.

When they take their rise from a general disorder of the system, that should be first attended to, and opposed by proper medical treatment ; then the excrescences are to be removed by the knife or scissors, and the wound is to be dressed as mentioned in page 21 ; for oily or emollient applications do not answer as dressings for the gums, as they do for muscular parts, nor can they be borne conveniently in the mouth.

Ulcers of the gums, where they do not touch the teeth, or form cavities, need only be treated with balsamic applications at first, and then with astringents, such as tincture of myrrh, sang. dracon. tormentil, bistort, &c., so soon as they are disposed to heal. The pain felt on these occasions, and which is called tooth-ache, on account of its being extended to the teeth by connection of the nerves and membranes, is to be mitigated by opiate and camphorated applications ; but if the inflammation and soreness are considerable, emollient gargles, such as decoction of quince-seeds, barley-water, or milk and water, with a few drops of tinct. thebaic. should be constantly kept in the mouth, until the state of the parts admits of the treatment mentioned above.

As the *extraction* of a tooth on this occasion is rather dangerous, than likely to avail against the pain, those who practice in this way, should take care always to examine the mouth all round before they apply an instrument ; and when there are appearances, such as we have described, they should send the patient to a surgeon, to whom this case more properly belongs, than to a dentist.

When excrescences of the gums have been long neglected and suffered to grow to a considerable size, the vessels, which supply

them, enlarge proportionally, and the cure is attended with uncommon difficulties.

A gentleman, aged about fifty-six, in a tedious and sickly passage from the East-Indies, was troubled during the three last months of the voyage with painful ulcers of the gums in the upper jaw particularly. Soon after his arrival they gave him no more trouble; but after three or four months he found a swelling, which was situated in the gums, near the internal side of the small molares of the upper jaw, on the right side, to become a little painful, and it enlarged every day. Thinking that this would *come to a head* (as he termed it) and then disappear of its own accord, like the former ulcers, he neglected it for two or three months longer, by which time it became as large as a walnut, very painful, and affected his speech. A friend of mine suspecting that it arose from some fault of the teeth, for they were all discolored and dirty, told him to call on me. I advised him to have it immediately cut away even with the surface of the gums, which he readily consented to, and insisted on my doing it. After having prepared an astringent gargle, I performed the operation with the *crooked bistoury*. The blood poured forth very quickly, and the astringent liquor, which I advised him to keep in his mouth, did not check it in the least: I was therefore obliged to cut a piece of agaric of the proper size, and to apply it with a thick compress of linen, which the patient held fast on the part for two hours. We then attempted to take it away, because the gentleman could not eat or sleep in this manner; but the blood flowed again in considerable quantities, although not quite so fast as before, and I found it necessary to lay on another piece, not quite so thick as the former, which was continued till it dropt off the day following. For three or four days his mouth was frequently washed with astringent gargles; after which I thought it best to commit it to nature; but in five or six days he returned, and said, the excrescence began to shoot forth again; I found he was right, and notwithstanding the frequent applications of rougher astringents, six weeks were elapsed before it began to lessen and heal.

Had any matter appeared at the root of this tumor when it was cut away, I should have laid bare the bone and examined it; but the healing of the wound in some time after the excrescence was repeatedly taken down, showed that the bone was not in fault.

## CHAPTER VI.

*Recess of the Gums, Exposure of the Roots of the teeth, and the Tooth-ache arising therefrom.*

SCORBUTIC, venereal, and putrid disorders dispose the fluids to acrimony, and the solids of the whole system to dissolution.

The gums in these cases generally suffer very early, because they are most exposed to violence and injury, and to the external air, which is the most powerful agent in putrefaction ; and also because in venereal cases the medicines generally administered seldom fail to bring on inflammation and ulcers of these parts.

The roots of the teeth are often exposed without any sensation of pain, especially when the gums have receded slowly, and when the successive portions of the roots so exposed have been gradually withered and dried, and their nerves thereby deprived of their accustomed sensibility. But even then the evil is not the less formidable, because the teeth are exposed to caries, to catch and retain portions of food in their interstices, to give a stinking breath, to be loosened, and even to be pushed entirely out of their sockets on every slight occasion.

A tooth-ache arising from this cause is easily distinguished by looking into the mouth, and by finding that the patient is, or lately has been, troubled with some of the above named disorders. If the exposed roots are become carious, extraction is the only cure ; because, the bony substance of the teeth never exfoliates, or unites with the gums or periosteum, where it is thus affected ; nor even although the carious surface should be cleared away by puncture, scraping, or otherwise.\*

But as this is not often the case, and as the roots of a number of teeth, in the forepart, are frequently long exposed, without any strong appearance of bad colour or decay, the disease and pain are to be removed in a more effectual and judicious manner.

The treatment is partly medical, partly chirurgical : the former consists in removing the original and general disease of the whole body by a due course of medicine, and in washing the mouth frequently with antiseptic and astringent liquors, such as infusion of roses, betony, granate-peel, bistort, and tormentil-roots, rendered slightly acid, by means of orange, lemon, or sorrel-juice, or vinegar. The chirurgical treatment is more immediate and effectual, and consists in scarifying and pricking the affected gums, and destroying their tender outer skin in such a manner, as to occasion a fresh shooting forth and elongation of their substance,

\* Some practitioners are of a contrary opinion ; particularly the ingenious Mr. March. Therefore I only offer this as the result of my own observation.

and such a solidity as will endure the usual impressions of mastication. When they have lost their connection with the teeth, or when they do not embrace them closely, cutting a small slip away from the forepart is of considerable service; for the new gum will then adhere to the tooth, or at least will embrace it more closely. During the time necessary for completing the cure in this manner, opiates, solution of camphor, or a few drops of the nitrous æther, in common spirits, may be used with due caution and in proper form, to mitigate or remove the tooth-ache.

I say, one or other of these may be used; but it is not easy to determine, any other way than by trial, which of them is best in any tooth-ache: for I have found opium extremely offensive in some pains of the teeth, which yielded to *camphor*, and *vice versa*, camphor has failed where *opium* has succeeded, without my being able to determine what is the cause of this variation.

A recess of the gums in scorbutic disorders is very frequent; but it is not often cured, when it has been of long duration, even although the scurvy which gave rise to it be entirely removed; because very few of the people who are thus affected look upon the complaint in the serious light that it deserves, nor have they patience enough to submit to repeated operations, however trifling, or to persevere long in any treatment which does not produce a visible change for the better in a very short time.

But if the patient will follow instructions punctually, and if the general disorder of the system be corrected by proper medicines, I think the surgeon dentist will seldom fail of success in cases of this kind.

A tradesman of this town applied to me about six months ago, desiring to have his teeth cleaned; and asked, at the same time, for some *tincture for curing the gums*, for his, he said, were going to decay.

I examined his mouth, and found the incisors of both jaws entirely naked to the very extremity of each root. After some discourse, I found he had been for many years troubled with the scurvy, but was lately cured by an eminent physician, who, amongst other things, ordered bathing at Margate. I told him that no tincture could cure him, but that if he would submit to the trouble of having his gums cut five or six times successively, and if he would use such washes as should be directed from time to time, I would do my best endeavors.

He was willing to follow my advice, and I immediately began with removing the tartarous crust which covered his teeth. I then scarified the gums near the edge in many places, and cut away entirely the weak skin which covered their extremities, to allow the fibres underneath to shoot forth more freely. After the

operation, I directed him to wash his mouth five or six times a day with a liquor composed of stimulating balsams, and to return in a few days. By this time his gums began to heal, but were not sensibly elongated; I therefore brushed his teeth clean again with a proper powder, and repeated the scarification, &c., as before. After this the gums began to extend themselves along the teeth; but the progress was so slow as to require the fifth or sixth operation, and the constant use of balsamic washes, which I changed occasionally to prevent disgust; and thus, at last, after a perseverance of six weeks, the gums were completely restored, and have remained sound ever since, by the assistance of astringent washes and brushing.

A recess of the gums occasioned by tartar is treated of in the next chapter.

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## CHAPTER VII.

### *Of Tartar of the Teeth, and the Recess of the Gums, and Tooth-ache occasioned by Tartarous Concretions long neglected.*

IN febrile disorders, and when the salivary liquor is not freely poured forth, as when we sleep, or when the neighboring muscles are not in action, we observe, that a sort of viscid yellowish substance is formed on the teeth, which most probably is at first nothing more than the saliva inspissated in different layers, and adhering to the *teeth particularly*, because their inelastic immovable substance gives it an opportunity of lodgment, and does not, like the softer parts, ooze out a moisture to destroy its consistence and adhesion,

This viscid matter is the bed in which tartarous or earthy particles rest themselves, whether collected from the salivary liquor or from the putrid reliques of food left between the teeth, or from both; it is soft and yellowish, sometimes of a dark brown, and disfigures the whiter and smoother enamel that lies underneath. When it is long neglected in this state, the daily access of fresh matter, and the continued dissipation of the more fluid parts, render it thicker and harder, and more intimately connect it with the enamel, so as at last to form, in a manner, one continued substance with it, and sometimes to acquire a solidity equal to stone.

The discoloring of the teeth and the deformity of them, are not the only evils that attend it; for in its progress it insinuates itself between the teeth and gums, brings on inflammations and pain, destroys their connections, generates fungi, ulcers, and flabbiness, occasions the gums to recede, and at last, by its constant pressure, brings them to waste and decay; in consequence of this, the

teeth are not well supported, and the air or acrid food are free to attack them below the enamelled part; whence tooth-aches, caries, looseness, and fetid breath often take their rise. All these evils are the fruits of sloth and negligence, for they are easily prevented, and, when recent, very speedily cured.

The preventive method shall be treated of hereafter, and the cure varies according to the degree of the complaint. For there are several sorts of tartar, differing remarkably in color, thickness, hardness, and adhesion from the soft slough that gathers over night, or in sickly people, to the large and stony substance which often envelopes in one uniform crust all the teeth of either jaw, together with a considerable part of the gums.

That soft matter which gathers on the teeth over night, is easily removed by brushing and washing them frequently, and freeing them carefully at night from the scraps of food which are apt to lodge after supper.

A slight discoloring of the enamel is removed by rubbing the teeth with certain testaceous powders, which are prepared for that purpose, and which do not grind away the enamel like those that are commonly sold under the name of *tooth powders*. But these are only to be used till the enamel is cleaned and polished, then to be repeated occasionally at proper intervals, when the daily use of a tooth-brush is not found sufficient to preserve the teeth from future tarnishing of the same kind, or when it has been neglected.

The *crumbling*, or the *hard scaly tartar*, is to be removed by means of particular instruments, which the surgeon dentists use, beginning at the gums, and raising it off in layers from the teeth: for when the tartarous matter is hard or thick, scraping is tedious and ineffectual: then, what the instrument has left behind, or the discoloring matter that still adheres to, and shades the beauty of the enamel, is to be removed by the use of harmless tooth-powders, as mentioned above.

The inflammation of the gums occasioned by tartar is often very violent, and requires to be treated with emollients, as in page 18. When they are depressed or decayed, their growth and adherence to the necks of the teeth is to be encouraged, after the removal of the tartar, by the methods related at page 25. But if the tartarous matter has so far insinuated itself between the teeth and gums, as to widen the openings which the gums form for the passage of the teeth, a small piece is to be cut away in the fore part of each; for without this, the gums will not closely embrace a tooth which has been made smaller at the collar by the removal of its tartar.

The treatment of the wounds after these operations is the same

as was delivered at page 21; and the pain attending this exposed condition of the teeth, whilst they are under cure, is palliated and relieved by camphorated opiate and spirituous washes, and sometimes most effectually by the application of peppermint-water, with a few drops of nitrous æther added to it.

Before we conclude this chapter, it is necessary to inform the reader, that the enamel in some people is discolored throughout its whole substance; in which case, the removal of the tartar will only prevent diseases of the gums, but cannot impart whiteness to the teeth.

Without being apprised of this, some people, who are ill advised, continue the use of tooth-powders, electuaries, and tinctures, and scraping with instruments, long after the tartar is gone, and even until the *enamel* itself is quite destroyed. In consequence of which, they are affected with the slightest impressions of heat, cold, sweet-meats, acids, &c., and are very seldom free from the tooth-ache.

It is remarkable, that the generation of tartar depends as much (if not more) on the constitution of the patient, as on neglect, or rough enamel, or snagged teeth; for whilst some people, without any care, have their teeth always smooth and free from tartar, others have it collected in great quantities; and in a few, the generation of such stony matter is so quick, and in such quantities, as to exceed the belief of any person who is not particularly versant in this business.

A gentleman of the bank, not above twenty-three years of age, applied to me about a year ago for advice concerning his teeth, which he said were of a very uncommon kind, and gave him constant pain.

I found them perfectly buried in tartar, by which each set was united into one continued piece, without any distinction, to show the interstices of the teeth, or their figure or size. The stony crust projected a great way over the gums, on the inner side, as well as the outer, and pressed upon them so hard as to have given rise to the pain which he complained of. Its thickness at the upper surface was not less than half an inch, and the crust that covered the external side of the incisors of the lower jaw was so large as to throw the lip forward considerably.

As the teeth are easily affected by cold, after the removal of tartarous concretions of the ordinary thickness, and as a great deal of time would be necessary in this gentleman's case, I thought it safest and most convenient to scale away this uncommon quantity of tartar at proper intervals. I removed the whole in about a fortnight, taking off a little every day, and then with a brush dipped in tooth-powder, made them perfectly clean and

white. But they were naturally very far distant from each other, and the gums were considerably injured and forced away by the constant pressure of the tartarous crust; I therefore scarified them in many places near the edge, and advised the patient to use the tooth-brush two or three times a day, to keep the teeth clean, and to encourage the rising and strengthening of the gums. In about ten or twelve days I perceived them so far restored, that I told him nothing more was to be done, except to keep the teeth clean for the future, and to brush the gums.

In the space of half a year he came to me again, and I found his teeth covered with a new crust of the former kind, as thick as a crown-piece. This was the more surprising, because he told me he had not neglected to brush his teeth as I had directed; I therefore thought it necessary, after having removed this second growth, to recommend to him the daily use of testaceous tooth-powders, and a harder brush.

This is not the only case of the kind which I have seen, but it is the most remarkable, on account of the age of the patient, and the quick regeneration of the stony matter.

The luxations of the teeth, and other evils occasioned by tartar, shall be considered in the next chapter.

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## CHAPTER VIII.

### *Of Looseness of the Teeth, Change of Position, Protrusion, Total Luxation, and the Tooth-ache arising from these causes.*

A LOOSENESS of the teeth is occasioned by recess of the gums, or tartarous concretions, or violence, or by the withering and decay of the connecting membranes and vessels, as happens in certain disorders, and in old age. It is easily discovered by the touch; and the cure is more or less difficult according to the degree of motion it admits of, and according to the nature of the causes which produce it.

When it is owing to a loss of gums, as in scorbutic, venereal, or putrid disorders, we must have recourse to the same general treatment as is mentioned in page 25; the loose teeth should be made fast and steady, by connecting them with the neighboring sound ones, by means of *gold wire* or *silken ligature*; and care should be taken not to press on them for some time in mastication, or with the tongue. Astringent washes and brushing the gums should be continued long after they are renewed and healed; and during the course of the cure, the tooth-ache, which may return from time to time, should be relieved by the use of sedatives, as mentioned before.

A looseness of the teeth is occasioned by *tartar*, when it insinuates itself between the teeth and gums, when it destroys their connection, extends along the roots, and, by pressing on the gums, brings them to decay.

Such a looseness may be easily distinguished by any person who knows what tartar is, and what evils it may produce; and it is cured by removing the tartar, by treating the gums as directed in page 25; by fastening the loose teeth by ligature; and lastly, the pain attending this sort of looseness and exposure of a tooth, is alleviated or removed by the sedative applications mentioned above.

When a tooth is loosened by violence, but not moved out of its socket, ligature alone, and astringent washes to brace the gums, are sufficient for the cure. In this case, the pain ceases with the looseness of the teeth; but if it be violent in the beginning, sedatives must be applied.

When the looseness of a tooth is owing to a decay of the connecting membranes, it can never be made perfectly fast; but by scarifying the gums, by the use of astringent gargles, by the help of judicious ligatures, and by avoiding all future violence or strong efforts in chewing with this part, such a tooth may be preserved tolerably firm and sound for many years.

A change of position of the teeth happens in various ways, as when they incline inwards, outwards, or to a side; or when they are turned round in their sockets, so that their edges stand across the line of the rest. It is the consequence of looseness, violence, or of the loss of a neighboring tooth.

When a tooth loses its natural position, without departing from the socket, in consequence of preceding looseness, it is to be reduced to order, and then retained steady in its proper place, by means of ligature, for some weeks; the cause of the looseness is to be removed, and the gums are to be braced round it by means of astringents. The nerve of the tooth is, in this case, generally broken off, and the tooth-ache which attends it, is owing to the pressure of the point of the root on the lacerated nerve at bottom; it should be pressed on, therefore, as little as possible; and if the uneasiness continues after it becomes pretty firm in the socket, a little of the top should be filed off, that the opposite tooth may not bear on it at all.

The same may be said of teeth which are pushed inward, or outward, or to a side, by violence.

The teeth that change their position, and incline to one side, in consequence of the loss of a neighboring one, may be brought back, or at least preserved from total luxation, by the interposition of an *artificial tooth*, which will support them, and, in process of

time, perfectly restore them to their former situation, provided it be well fitted in.

But if it appears that the inclination of two teeth towards a cavity is not likely to be attended with any looseness of them, some people are of opinion that it is best to let them take their bent, since it helps to fill up the void space, and since the neighboring ones may also be approached in like manner, by the help of ligatures, so as to leave little or no appearance of a lost tooth, after some months; but this is a practice which I do not think by any means advisable, for the interposition of an artificial one answers the purpose better for use and ornament.

The spungy, cancellated texture of the bone which forms the sockets of the teeth, and the vascular membrane or periosteum which covers their roots, gives rise to a particular sort of dislocation of the teeth, in certain circumstances.

It appears by experience that the pressure of the teeth against each other, in mastication, is the chief cause which retains them so long in their places; which prevents the spungy bones of the sockets from shooting forth their fibres, and filling up so small a cavity; and which counteracts the tendency which the periosteum, especially near the conical point of the root, must necessarily have to protrude the teeth, when its vessels are swelled or overcharged, from defluxion, inflammation, or otherwise.

Accordingly, in those who have lost a tooth, and where the corresponding tooth of the other jaw is thereby deprived of the usual pressure and resistance, we observe that this last very frequently rises above the common level, and is generally supposed to grow longer, until after some time the patient finds it less firmly fixed in the socket, and then is taught that it has been protruded from its natural bed. When a tooth has in this manner risen far above the level, and when by remaining so long, or by some slight injury, it becomes loose, the first care is to keep it fixed and immovable, by means of a ligature, for some weeks, and to use astringent gargles very frequently, until it becomes totally firm; then it is to be filed down lower than the level of the rest, to save it from further injury in mastication, and to prevent the pain, which in this case is felt severely whenever the patient chews, on account of the whole pressure of the jaw falling on the prominent tooth, and forcing its point violently against the distracted or torn nerve at bottom,

When a tooth is protruded beyond its due bounds, but still remains firm and immovable, the prominence should be filed down; but if the case is recent, and the protrusion not considerable, or an artificial tooth judiciously fixed in the opposite cavity, that is in the place of the lost tooth, gives such a counter-action and

pressure in mastication, as prevents this from becoming any farther prominent.

I know there are some people who object to the use of artificial teeth, as a sort of effeminacy and foppery. But if they are insensible of the disadvantages attending the loss of a tooth, in mastication, speech, and aspect, they ought surely to consider that, since an artificial tooth prevents the dislocation and loss of an opposite natural one, the practice is rational, and as interesting to a man who dreads deficiency or disease, as it is desirable to those who dread deformity.

By *luxation* of a tooth, I mean when it is raised partially or totally from the bottom of its socket.

*Luxation* is preceded by long neglected looseness of the teeth, or is occasioned by violence; in either of which cases it is very rarely reduced or cured in this country, because it is not generally known to the people that such things are practicable; wherefore they pick out the tooth so luxated, and fling it away.

But the surgeon's art and long experience have taught, that a tooth, which has been partially or totally forced out of its socket, may be restored again to its former situation and firmness, and may serve for use and ornament to the latest period of life; provided the following cautions and instructions are duly attended to on the part of the operator, and also on the part of the patient.

With respect to the operator, he is to observe that, in a luxation which happens in consequence of long neglected looseness, or loss of gums, or old age, he is not to be hasty in attempting a reduction, or promising a cure; for a tooth which has been long loose has generally a short root, shallow socket, and bad gums; all which prevent its fastening well again; when the gums are lost, also, the reduced tooth seldom takes hold, or is well supported; and in old men the sockets fill up at botom, the alveolar border shrinks away, the gums retire, and the teeth which are once luxated cannot therefore take hold at first, nor receive the necessary support afterwards. In these cases, therefore, I should prefer artificial teeth, before an attempt which promises no certain success.

It is also to be observed, that a reduction is only practicable in the fore teeth, whose roots are single; or in such of the molares as consist of straight conical roots, which will easily enter the bed from which they have been forced.

The cases where reduction may be practised with the greatest hopes of success are, when the patient is young, and where, in people of middle age, the gums are sound.

In young people a tooth which has been luxated, if instantly replaced, and forced quite to the bottom, need only to be secured

by a ligature for some weeks; and astringent applications are to be long continued and often repeated to brace the gums.

But when the same accident happens to a grown person, when the tooth is totally beat out, or when a surgeon is not at hand to reduce it in the very instant the swelling of the vessels and extravasated blood prevent its sinking so deep as before; and as a prominence above the rest of the teeth would expose it to future injury and pain, it is found necessary to cut off a little piece of the point of the root, to smooth it well, to fill the hole in which the nerve formerly lodged with lead or gold; then to reduce it carefully, and fasten it to the neighboring teeth by a golden wire or silken ligature; and the gums are to be treated as at page 25.

For people advanced in years, a hole should be drilled through the tooth sideways, close by the edge of the gums, before it is replaced; through which the gold wire or silken ligature should be passed, to secure the tooth more perfectly.

When the teeth have stood very close together, it is generally necessary to file that which is to be replaced, on the sides, that it may more readily enter the vacancy.

In this manner also, such teeth as have been extracted by the dentist, may sometimes be reduced with success; nor does it imply any error in practice to take out a tooth, and then to replace it; for a tooth-ache often arises from a caries and disorder of the nerve; which last must be destroyed before any relief can be obtained. This, in the case before us, can only be effected by extraction: the carious part is then to be filed away, or, if the tooth be hollow, it is to be scraped clean, to be prepared as above, then filled with gold, lead, &c., and replaced as soon as possible in the manner related above, after having first cleared away the grumous blood which may have lodged in the socket.

But after all that has been said on this subject, I think it necessary to add, for the sake of undissembled truth, and to prevent the imputation of countenancing the impositions which occur every day, that the success on all these occasions, however sufficient to justify the future trials and practice of honest and judicious people, is by no means equal to the extravagant assertions and promises of certain advertising imposters. In the most favorable circumstances, it is more than an equal chance, that a tooth once extracted or beat out never will fasten again.

Of all those that I have seen reduced, or that I have reduced myself, the greatest part are so far from adhering firmly, that they can easily be pulled out with the fingers; the patient can very seldom bear to chew with them; and even where reduced teeth have lasted firm for many years, I am of opinion, that it has been owing to the exactness with which they fitted their sockets,

together with the firmness of the gums, and not to any renewed connection with the periosteum or bone of the jaw.

It is also proper to observe, that teeth so replaced, often create intolerable uneasiness, pains, and inflammation; for which reason I do not recommend such methods to be frequently or indiscriminately tried, nor do I often use them in my own practice; although I know there are people who make such business well worth their attention, and to whose care I recommend some patients, who are determined on the trial, even although I refuse to be concerned.

The tooth-ache which attends luxations is of the inflammatory kind, or is owing to exposure of the nerve; the first sort is to be treated as mentioned at page 18, and 23; the last is relieved by the use of sedatives.

Now if this be admitted as a candid declaration of the truth, and as the language of a man whose interest it is to conceal the imperfections and failures of his art; if a tooth just extracted, and instantly replaced in a socket, which it fits in a manner no art can equal, fails of taking hold, more frequently than it succeeds, and generally is attended with uneasiness and pain, if not with violent inflammation; what shall we say of those who pretend to supply one man with the teeth of another, with teeth which cannot fit properly once in a hundred trials; which must necessarily press on the socket unequally, and therefore occasion inevitable pain and inflammation?

The few instances in which they succeed, surely are not sufficient to counterbalance the hazard; and were these people properly versed in the dentist's art, they would certainly prefer the healing of the socket, and the use of a well-constructed artificial tooth, or a human tooth with the root filed off, and formed to fit the void space exactly: for this will occasion none of the evils that attend the former practice, which is not only precarious, ineffectual, and dangerous in general, but also immoderately expensive; for it is not to be supposed, that any young person will sell a handsome sound tooth, to be torn out of his head, without being extremely well paid for his loss and pain.

In many instances where this transplanting of teeth has been thought to have succeeded, I am well convinced, that a new crown has been grafted on the old root, or the extracted tooth has been replaced, as related above; and the patient has been made to believe that a new tooth, extracted from another person for the purpose, is placed and made to adhere in this manner. Instances of both sorts of deception have more than once fallen under my own observation.

## CHAPTER IX.

*Of Fractures of the Alveolar Part of the Jaw-Bones, of sharp Splinters, of Portions of the Roots of the teeth left behind in Extraction, of Bruises and Lacerations of the Gums, and of the Tooth-ache arising from these causes.*

THE dexterity of those gentlemen who brag how they can whip out a tooth quicker than other men can look at it, would be worthy of imitation, were it not frequently attended with the extraction of teeth whose disorders might easily be cured; or with the loss of many sound ones, by hasty mistaken application of the instrument; or with one or more of the other evils enumerated at the head of this chapter.

It happens, likewise, that the instruments which are most easily applied, and most frequently used by the tooth-drawers, are also those which act in the most disadvantageous manner, and whose chief power is exerted in breaking the external side of the socket, and in bruising and tearing the gums, instead of fairly raising the tooth upwards.

Under these inconveniences, the sudden exertion of the operator's force to jerk out the tooth in an instant, acts pretty nearly in the same manner as a smart side blow of a hammer would do; that is, it knocks out the tooth, but does not draw it safely.

The itinerant mountebanks, who affect this sort of dexterity still more than the barbers or common tooth-drawers, are not contented with resting here; for they not only whip out a tooth *before the patient can look about him*, but they endeavor also to make the people believe that they do it without an instrument, or by *conjunction*; and for this purpose, they are obliged to use such instruments as are most easily concealed in the hand, rather than those which are safest for the patient.

To these causes chiefly we may refer the frequent instances of fractures of the socket, and even of large portions of the more solid part of the jaw-bone, together with the various evils enumerated in this chapter.

If the fractured part be considerable, and not torn from its connection with the gums, it should be replaced immediately, and retained in its proper situation by means of a compress fixed between it and the cheek, after having been dipt in some mild balsamic tincture. If the fractured piece is already torn a good deal from its connexion with the gums, it must be entirely removed, the gums are to be replaced, and the wound dressed as above. But if the fracture is not large, the only care is to remove

any splinters which point outwards, or threaten to offend the healing gums.

As a tooth sometimes adheres and grows to the socket, so as to form one continued piece with it, it is necessary to observe, that a fracture, in that case, is not the fault of the operator. When it happens also, that a hidden caries of the jaw-bone has given rise to a tooth-ache, and, when close by the affected part, a tooth is extracted, the operator is not to be blamed, if a large piece of carious bone comes away: for here the fracture is inevitable, and instead of being hurtful, is the only effectual step towards a complete cure.

After slight fractures of the edge of the socket, if the operator has neglected to remove the sharp pointed splinters which are raised, the gums grow over them, and being constantly wounded by them, are exposed to inflammation and pain, which never cease until the splinters have been suppurated away, or until the surgeon removes them with his instruments. The pain in this case has often been referred to some fault of the neighboring teeth, many of which have been extracted before the real cause has been found out.

The same errors in the choice of instruments, and in the hasty empirical use of them, are the most frequent causes, that a part of the root is left behind in extraction; and, I believe, that with the oblique power of some instruments, and the sudden snap given by the tooth-drawer, a tooth would very seldom come out unfractured, were it not for the soft yielding external edge of the socket.

The tooth-ache arising from a portion of the root left behind, is most effectually and instantly relieved by extracting the stump.

If the patient is unwilling to try this second operation, the pain may be sometimes removed by burning the nerve, or by applying a very small bit of lint dipped in essential oil of cinnamon over the hollow part of the stump, or by introducing a bit of paste made of opium, camphor, and essential oil of peppermint.

These sedative palliative applications very frequently answer extremely well; and it is on this principle that some people in town make considerable sums of money by curing the tooth-ache, by means of pretended nostrums or secrets, and that they all can produce many testimonies of their success.

Whether the nerve be destroyed by fire, or acrid liquors, or deprived of its sensation by sedatives, the root, losing its connections with the socket, is, after a little time, protruded and loosened, and then very easily extracted.

Indeed, a stump or the root of a tooth is at all times easily taken out, unless it grows to the jaw-bone, which is a very rare

case ; and nothing is more erroneous than the popular notion that stumps are very difficult to be removed, and that digging and punching (as they call it) are absolutely necessary.

Whoever, therefore, assumes an operation of this kind as his chief excellence, pays a very miserable compliment to his own understanding, and insults the judgment of the people, by offering to them, as a matter of great importance, what scarce requires common sense.

When the gums are caught between the heel of the instrument which is commonly used, and the tooth that is to be extracted, they are frequently bruised and torn ; and in fractures of the jaw-bone the wounds of the gums are often very large. The socket in either of these cases does not heal so soon as usual, the parts inflame, and sometimes suppurate ; the nerve at bottom, and the naked roots of the neighboring teeth, are exposed to the air and other injuries, at the time when they are most susceptible of irritation, pain, obstruction, and caries.

The method of cure consists in replacing the gums, in removing the inflammation, in disposing the part to heal, in preserving it from external air and the relicks of food, in mitigating the pain, and lastly, in the use of astringents ; all which have been treated of and explained in various parts of the preceding chapters. It is not surprising, that a troublesome hæmorrhage should sometimes follow fractures of the jaw-bone, or deep wounds of its periosteum and gums, or even the simple extraction of a tooth. For if in any of these cases a few arteries are cut off, close by the surface of the bony canal in which they pass, and to whose circumference they are immovably connected, they cannot shrink and close, to stop the blood like the elastic contractile vessels of the muscular parts, but must continue to pour it forth in a constant undiminished stream ; and all the idle compositions, styptics, and astringents, generally applied, can avail nothing, where the parts are not at liberty to follow such impressions.

An hæmorrhage from simple extraction of a tooth is most effectually stopped by filling the socket with lint, agaric, sponge, or cork ; then by placing narrow compresses over it, until the whole exceeds the level of the neighboring teeth ; and lastly, by ordering the patient to approach his jaws, and press the dressings tight into the socket.

An hæmorrhage from wounds of the gums or periosteum is not dangerous or lasting, and only requires styptic applications, such as alum water, spirits of wine, &c. An hæmorrhage from a small fracture of the jaw-bone I have seen very troublesome and very lasting on some occasions, whilst, in other instances, large fractures have been attended with very little loss of blood, as happened in the following case :

About five years ago a young woman, aged twenty-three, went to a certain barber-dentist in this town to have the last molaris of the upper jaw on the right side taken out, on account of a violent tooth-ache which it occasioned. He applied his instrument with great agility, and made a strong effort to extract the tooth, but to no purpose. Uneasy at the disappointment, he intreated the patient to allow him a second trial, promising that he should certainly succeed with another instrument. She at last consented ; he fixed his instrument, and with a sudden exertion of all his strength, he brought away the affected tooth, together with a piece of the jaw-bone as big as a walnut, and three neighboring molares.

The violent distension of the muscles of the jaw on this occasion brought on immediately a great soreness and inflammation of them, and this, joined to the inflammation arising from the fracture and laceration, extended to the muscles that serve for deglutition, to such a degree, that two hours after the operation she could hardly swallow.

But the inflammation and pain were not so dreadful to the patient as the deformity which was likely to ensue : she consulted her friends ; I was sent for, in the absence of Mr. Green, and having waited on her immediately, I received the history of this affair in about three hours after it happened, just as I have related it.

After looking at the wound, and examining *the piece* which was broken off, I told her, that nothing could be done, except to encourage the growth of the gums over the fractured bone ; and, after the healing of the parts, to fill up the void space with an artificial piece, to support the cheek and prevent the lodgment of the food in mastication. Upon this her friends seemed to be greatly disappointed in their expectations ; they asked whether there did not remain some possibility of replacing the teeth ? and, indeed, I believe they sent for me with that hope. I answered, that I thought it impossible in her case, but that it would be well done to consult a surgeon of eminence on the occasion. They acquiesced, however, in my opinion, and desired I should attend her.

The violent inflammation of her throat and face made it necessary to order bleeding and purgatives immediately, by means of which and nitrous draughts, these symptoms were removed in less than three days. The wound, I dressed, and filled with compresses in the manner related above, under the article of fractures, and the part was healed in about a month ; during which, time nothing remarkable happened, except the flow of mucus from the maxillary sinus during the first ten days, which gave the dressings and the matter of the wound an uncommon appearance.

The young woman after this would not admit of an artificial piece, and she still feels a difficulty in swallowing.

When splinters are raised in the extraction of a tooth, they generally fall away of their own accord, or, by the immediate and constant uneasiness which they occasion, they direct the patient to have them removed by the surgeon. But sometimes it happens otherwise, and they give no great trouble until the parts happen to be pressed on and wounded by their sharp points, a particular instance of which I have seen, and I think is not unworthy of observation.

A gentleman, who had the second dens molaris of the upper jaw on the left side extracted by a *tooth-drawer* in this town, about two years ago, happened lately to strike his cheek slightly against a chimney-piece. In some hours after he felt a throbbing pain in the gums, just over the place where the tooth which had been extracted, formerly stood. Next day the pain extended to the neighboring teeth, and became violent; in consequence of which he called on me, and desired that I should either take out a tooth, or do whatever else I should judge necessary to remove the pain. I found his teeth perfectly sound; and although the inflammation was not confined to any particular spot, I observed it most considerable and most prominent in the place above-mentioned. As the stroke which he received was too slight to occasion such appearances, were the parts not faulty before, I immediately concluded, that some splinters had been formerly raised, which pointing against the gums had wounded them on this occasion: I therefore made a crucial incision to the bone, and having found the splinter, which I before suspected to be there, I cut it away with a proper mouth-fleam, after which the patient complained of pain no longer, and the wound healed without any application.

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## CHAPTER X.

### *Of the Tooth-ache occasioned by excessive cold air, and the sudden alternation of hot and cold liquors.*

THE tooth-ache arising from either of these causes is seldom violent or durable in this country, except with delicate women, who live a sedentary recluse life, and with those who injure the enamel by the use of tinctures, electuaries, or powders, or by admitting the use of the file too freely.

Such a tooth-ache is easily distinguished, because the patient always knows and tells the cause: and it is cured by keeping the mouth filled as long as possible with warm water, or *spirituous peppermint water*; or, if that is not at hand, with any *ardent spirit*.

## CHAPTER XI.

*Of the Sympathetic Tooth-ache.*

WHOMEVER is acquainted with the pathology of our system, will not be surprised that a rotten or disordered tooth should produce a violent pain in a sound one on the opposite side, or even in the corresponding one of the opposite jaw. For it is well known that a caries of a tooth, in some people, constantly produces a violent aching at the ear; that irritation of the nose brings particular muscles, which lie very distant, into convulsive action; that an inflammation of the diaphragm produces a pain in the tip of the shoulder; that certain irritations of the stomach bring on a pain in the head; in short, an infinite number of such *sympathetic affections* occur every day.

This sort of tooth-ache must necessarily have occasioned the loss of many a sound tooth with the *dexterous* tooth-drawers, who generally apply the instrument to the tooth pointed at by the patient, and make a merit of whipping it out *before he knows where he is*, as they express it. And I am the more confirmed in this opinion, not only by the instances of such mistaken practice which have fallen under my own observation, but also by two cases, in which, through the obstinacy of the parties, I was forced to draw sound teeth contrary to my advice and inclination.

If the operator is not extremely careless and ignorant, a tooth-ache arising from sympathy is easily distinguished, by observing that the pained tooth looks sound and well, at the same time that there is a disordered one somewhere in the same jaw, or in the corresponding part of the opposite jaw.

The disease of the faulty tooth is generally caries or hollowness, which is to be treated with filing, burning, cleaning, acrid, camphorated, or sedative applications, or filling with lead or gold, as circumstances require.

But if these methods do not avail, and if the pain of the sound tooth continues, the disordered one must be extracted; for it is remarkable that the mechanism by which pain is conveyed from a carious tooth to a distant sound one, serves also to communicate caries and decay, unless the original cause is removed in due time.

A tooth-ache which arises from inflammation, or other general disease of the parts immediately contiguous, is treated of under these heads respectively, and does not require particular consideration, because it is not so singular, nor so easily mistaken, as that which we have just now mentioned.

## CHAPTER XII.

*Of Matter collected in the Maxillary Sinuses, and sometimes in the Cancellated Substance of the lower jaw, and the Tooth-ache arising therefrom.*

THE bones which compose the *alveolar arch* of the upper jaw, form, by their connection with other bones of the head, certain cavities, called the *maxillary sinuses*; these are lined with a vascular and glandular membrane, and they contain a sort of mucus, which passes off by the nose.

The membranous lining of these cavities is subject to inflammation, defluxion, or suppuration, like other parts; and the matter so generated, when it is long retained, and becomes acrid, produces erosion of the neighboring bones, and violent pains, which the patient calls tooth-ache, because the seat of pain is close at the roots of the teeth.

This tooth-ache may be distinguished from others by the following signs:

As the matter formed is preceded by inflammation, tension, and pain of the membranous sack, the disease begins with a deep-seated, throbbing pain, more or less violent, in the affected parts; then, after some time, a lasting, gnawing pain is felt, as it were at the roots of the neighboring teeth, attended often with a pain in the orbit of the eye, and in the ear. Those, also, who have ever experienced the common tooth-ache, can easily perceive that this is of a very different kind, that it is more constant, and less subject to increase or decrease from any impressions made by cold or heat, or medicines applied in the mouth. The only method of curing this sort of tooth-ache, is by drawing a tooth immediately under the affected part, and then by piercing through the bottom of the socket into the *sinus* or *antrum maxillare*, with a triangular pointed instrument, so as to give a free vent to the corrupted matter. After this, balsamic, spirituous and detergent injections are to be thrown in daily, to wash away whatever may remain, and to promote a laudable suppuration for some days, until the cessation of pain and good appearance of the matter show that *nature* can do the rest. In the mean time a little lint, wetted in any mild balsam, should be kept in the socket to prevent the access of external air.

A laboring man of a good constitution, and about forty years of age, happened in a quarrel -to receive a violent blow on the right side of his upper jaw, close by the nose and mouth. A considerable inflammation, attended with a throbbing pain in this part, and a slight fever, immediately ensued; in seven or eight days, ulcers were formed between the bone and integuments, and

matter began to be collected in the maxillary cavities, producing deep-seated, gnawing, incessant pains. He applied to a surgeon, but the methods pursued did not at all check the disease; for the purulent sinuses every day gained ground, extending under the gums on all sides, under the muscles which cover the maxillary bone, and into the cavity of the nose; so that the matter would gush out at the right nostril when the cheek was pressed on, and a little of it oozed away from some small openings in the gums. The gentleman who attended him in this unhappy state, recommended him, about a year ago, to an eminent surgeon for farther advice.

He immediately discovered the true cause and state of the disorder; he was pleased to send for me, and it was judged necessary to draw one or two of the molares, first of all. This was done with so much ease, that I suspected the jaw-bone to be carious; and as a large opening would be necessary for the exfoliation of the bone, and the discharge of the matter from so many various parts, I resolved to draw a third molaris, before I made any opening through the bottoms of the sockets, into the maxillary sinus. But in the extraction of this tooth, all further trouble was prevented; for a large piece of the alveolary part of the bone came away with it, and a large opening was made into the maxillary cavities, from whence two or three spoonsful of matter poured down immediately, so fetid that the stench was hardly to be borne.

A vent being thus given to the matter which lodged between the soft parts and the maxillary bone, as well as to that which was collected in the maxillary sinuses, the drain was so considerable for ten or twelve days, that it reduced the patient to the last extremity; for he had been long before emaciated and worn down by a hectic fever, and the little strength that remained was scarcely sufficient for the discharge on this occasion. Yet after all, by the humanity and good care of the gentleman who attended him, and by a treatment similar to what I have recommended above, he recovered perfectly in the space of two months. Had this patient been well advised at first, the matter would have drained away freely, and the disease could scarce have lasted ten days.

As the maxillary cavities communicate with the nose, and cannot, therefore, be looked on as having no communication with the air, it is surprising how long purulent matter lodges in them, sometimes, without acquiring acrimony enough to destroy the bones.

About two months ago, a middle-aged lady, who had tried all the nostrums which are advertised for curing tooth-aches, called on me for advice concerning a violent pain which she had felt for

three or four months past, in a greater or less degree, in all the grinders of the upper jaw on the left side. She added, at the same time, that she was sure her teeth were sound, and therefore would not permit any of them to be drawn.

After looking into her mouth, and considering her case in all its circumstances, many of which I now omit for the sake of brevity, I was obliged to tell her that, unless she consented to have a tooth drawn directly, the extraction of two or three might not be sufficient after some time. When I had explained to her the nature of her case, and thus represented the danger of delay, she submitted readily. I drew a first molaris and with a *graver* pierced through the bone at the bottom of the socket, into the maxillary sinus. A small quantity of matter issued forth; I injected a little tincture of myrrh and aloes with a syringe, then stopped up the socket gently with small, soft compresses, which were renewed for three or four days, after which no farther care was necessary.

Hence it appears that collections of matter in the maxillary sinuses should be removed in due time; and it is in general better to be hasty on this occasion, and to submit to the loss of a tooth, rather than by tampering and dalliance, to risk the health and life of the patient.

But on the other hand, we should not forget that nature sometimes brings unexpected cures; and our being hastily bent on operations and expeditious means, should not make us inattentive to the efforts and appearances which promise a change for the better, without any assistance of art.

I have seen a case, in which, after all the usual symptoms, the matter had passed away by the nose, occasioning a disagreeable smell, and staining the handkerchief; and it is not impossible but that matter thus collected may sometimes be reabsorbed and carried into the circulation.

Collections of matter in the cancellated substance of the lower jaw happen very rarely from any internal cause, but frequently arise from topical diseases of the neighboring parts, which have been ill treated, or long neglected. In ulcers of the gums, *caries*, and *purulent hollowness of the teeth*, and such like cases, if the acrid matter is permitted to lodge a long time on the bone or in the socket, erosions, deep cavities, and destruction of the osseous substance must necessarily follow.

The symptoms in this case are similar to the former, and the cure is obvious from what has been said above.

## CHAPTER XIII.

*Of a Caries and Exostosis of the Bones which form the Sockets.*

THE bones which form the jaws are subject to caries and exostosis, like those of other parts, and the pains which accompany these disorders, as they are extended to the teeth, are often complained of under the name of tooth-ache.

The exostosis is easily discovered by any person who knows that a tooth-ache may arise from such a cause; because the teeth to which the patient refers the pain, are sufficiently sound, and the jaw-bone, somewhere near at hand, discovers to the touch and to the eye, a protuberance, which, by overstretching the periosteum, is the cause of pain.

People who are not instructed in the nature and differences of disorders which produce a tooth-ache, are easily deceived in a case of this kind; and their error is seldom discovered before the patient has a great number of his teeth extracted successively, with the groundless hopes of being relieved of pain. But neither extraction, opiates, or external applications can avail. The soft parts which lie over the exostosis must be divided quite to the bone by a crucial incision; the exostosis is then to be cut away with a knife, or cautery, or broken with pliers, and the wound to be treated as is commonly practised by the surgeons, in cases where a bone is exposed.

When an exostosis of the jaw-bone produces pain, which is only felt in the part affected, and is not extended to the teeth in such a degree as to make the patient call it tooth-ache, it often happens that the protuberance is taken for a disease of the gum, and it is consequently treated with emollients, &c., *to bring it to a head*, as they term it; by which means it acquires fresh growth every day, and at last compels the patient to seek better advice, after having been tired with long repeated unsuccessful applications and nostrums.

A case of this kind very lately fell under my care, in which the pain ceased immediately after the incision of the gums and removal of the exostosis, and the part was healed in less than six weeks, although the exostosis frequently attempted to rise again during the first three weeks.

A caries of the jaw-bone occasioned by the lodgment of acrid matter, generated originally in the sockets, or in ulcerated cavities of the gums, has been treated of in the twelfth chapter. Here I mean that sort of caries which seems to begin in the *substance* of the bone, or at least in the periosteum, and destroys these parts, before any aperture or matter can be discovered externally.

This disorder is known by the incessant gnawing, deep-seated

pain that attends it, and by the constant inflammation of the soft parts that lie over it, which in process of time brings on lividity and ulceration.

The soft parts are to be divided by a crucial incision, and the bone is to be laid bare in this case as well as in the former. The carious crust should be pierced in many places quite through, until the instrument meets the sound bone : an exfoliation is then to be promoted, and the wound in due time is to be healed in the manner commonly practised by surgeons, after which the pain and tooth-ache cease of course.

From these two cases, and many others mentioned in this little treatise, the reader may easily perceive the absurdity and fallacy of pretending to cure every tooth-ache by means of *external applications*. He may observe, that we do not fail to recommend them, under the name of *palliatives*, where they are likely to succeed ; but on the other hand, it is evident beyond all contradiction, that by far the greater number of tooth-aches cannot be relieved by such treatment, and some of them may become dangerous to the health and life of the patient, if *that time* be spent in fruitless tampering with *nostrums*, which should have been employed in preventing the progress of the original disorder.

These remarks are peculiarly applicable to that kind of caries of the jaw-bone which attends venereal infection long neglected, and the abuse of mercury ; because the pain felt on these occasions is generally referred to the turgid and ulcerated state of the gums and periosteum, and very little inquiry is made to determine when it arises from less frequent and less suspected causes. In consequence of this, palliative and topical applications only are used, and the true source of pain is left undisturbed, until the rottenness and decay are so considerably extended, as to destroy the whole alveolar part, and thus to rob the patient of all his teeth, if not to put a painful period to his life.

A gentleman about forty-five years of age, who is now under the care of an eminent surgeon, whose friendship I have often experienced, was pleased to send for me some time ago to have advice concerning his teeth and gums, which he said had been long extremely painful and disordered, in spite of a variety of applications which he had tried under different people.

I found the gums and contiguous periosteum of the lower jaw entirely destroyed, the teeth discolored, and surrounded with fetid matter. The upper jaw was also affected, but not to so great a degree.

The long duration of the disease, the state of the soft parts, the removal of the seat of pain from the teeth to the solid part of the jaw-bone, and the color of the naked alveolar part, showed evidently that this last was carious.

Determined by these appearances, and by the judicious advice of the gentleman above mentioned, I applied my instrument to extract the third grinder, which stood in the most disordered part of the bone. It came away with great ease, and brought with it a large piece of the carious bone, together with four teeth which it enclosed. The part is now almost healed, under the care of the surgeon to whom he is entirely indebted for this cure ; but it is to be feared, that another operation of the same kind will be necessary on the opposite side, through the patient's neglect, in permitting the caries to extend itself so far before he called for proper advice.

Indeed, I believe, that if this case had fallen under skilful hands at its first rise, an incision of the gums and puncture of the affected bone, or at the worst, the extraction of one tooth, would have put an end to the disease, provided the venereal infection had been judiciously treated at the same time.

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#### CHAPTER XIV.

##### *A Caries of the Teeth, and the Tooth-ache arising therefrom.*

A beginning *caries* is discovered by spots of a dead white, or yellow, or brownish hue, accompanied generally with slight fissures and perforations of the enamel ; a more advanced stage of it is shown by a lividity or superficial blackness : and the last degree of it, by loss of substance.

Exclusive of the different stages of the disease, it is to be distinguished also by the manner in which it proceeds, and the part of the tooth which it attacks ; for it sometimes destroys the teeth quickly, with a wet and livid rottenness, and is then called a *wet caries* : at other times it acts more slowly, and the affected part is yellow, dried, and withered ; then it is called the *dry caries*.

The former sort affects a tooth in the middle of its upper surface *most commonly*, and proceeds quickly to the cavity in which the body of the nerve lodges : the other attacks it laterally, gives less pain, acts more slowly, does not happen so often, and is more easily checked in its progress.

The molares, on account of their grinding on each other in mastication, lose the enamel of their upper surface before any of the other teeth ; and therefore are much more frequently affected with that sort of caries which perforates the teeth perpendicularly, exposes the nerve and vessels, gives rise sometimes to fungus excrescences of them, which some people have mistaken for worms of the teeth, and occasions that constant oozing of fetid matter from the exposed vessels, which distinguishes the *wet caries*.

It is remarkable, that the upper molares are more frequently carious than the lower, and the *dentes sapientiae* in general suffer sooner than any of the other grinding teeth.

Fissures, perforations, and white or yellow spots of the enamel, should not be meddled with ; for teeth are very often seen to last in such a state for many years, without any of the inconveniences which attend the total exposure of the bony substance when the enamel is filed away : but when it happens that this affection of the enamel makes hasty strides towards lividity and true caries, then it is to be treated in the manner related hereafter.

A superficial or dry caries, if it does not appear to advance very quickly, should not be meddled with, because it cannot be removed without destroying the enamel, and because such a cure is often productive of greater evils than the disease itself ; for it exposes the bony part of the tooth, and gives rise to pain and new disorders on every slight occasion ; whilst the superficial caries, if left to itself, might remain without increase or inconvenience for many years, as we frequently observe.

Sometimes, however, it proceeds quickly to destroy the substance of the affected tooth, and must be filed away totally. Then the bony surface, which is exposed by the operation, is to be covered with a bit of lint dipt in a stimulating balsam, or if this cannot be conveniently applied, with a bit of gum tacamahaca, gum juniper, ambergris, or of gum mastich, properly fastened in.

At other times it attacks the whole crown of a tooth on all sides, particularly when the enamel is worn or filed off ; and although it does not waste it very fast, it renders it incapable of bearing the slightest pressure or cold.

Acrid, aromatic, camphorated, and sedative applications remove, *for the instant*, the pain which is felt occasionally ; but if it should return often and violently, and if the extreme sensibility of the affected teeth prevents the patient constantly from chewing on that side, extraction is by all means advisable, else the neighbouring teeth will become tartarous and protruded for want of use.

When the *wet* or *livid caries* attacks the upper surface of a tooth, it should be immediately removed by proper instruments : if it has already made its way into the cavity, in which the body of the nerve and the vessels lodge, and occasions violent pain, the nerve should be destroyed, by applying the *hot iron* which is made for this purpose : a little lint, dipt in *oil of cinnamon*, should then be placed in the cavity for two or three days, to shrivel such part of the nerve at bottom as might have escaped the iron, and to correct the putrefactive liquor ; after which, the burnt and carious parts are to be cleared away, the hole is to be widened a little, *if necessary*, and then filled with gold or lead, &c.

For those who dread the actual cautery, and will not submit to it, a drop of spirit of vitriol or nitre may be catched on the end of a probe, and introduced carefully into the cavity: a drop of soap-lees, or a bit of lunar, or common dry caustic, will answer the same purpose; but none of them so well as the actual cautery; because their action cannot be so easily or so immediately directed, nor can the saliva be prevented from blunting their corrosive quality. When the pain is already violent, and when the actual cautery cannot be used, oil of cinnamon, or of cloves, applied in the cavity, shrivels and destroys the nerve more gently and slowly than caustic applications, and after some days, suppresses its sensibility so far as to admit the use of instruments to clear away the carious parts, to widen the cavity, and to fill it with gold or lead, to prevent the future access of air, the lodgment of food, and the farther progress of the disease.

Wherever gold or lead cannot be borne in this manner, some of the tough resinous substances, mentioned above, should be used, until the parts are less sensible, or better accustomed to such a sensation; and it is in general to be observed, that the gold, lead, or gum, should not project beyond the *common level*.

When the caries has been neglected until the bony substance of the crown is almost destroyed, the remaining enamelled shell is to be filed down even with the gums; and the *crown* of a human tooth of proper *shape* and *size* may be artfully fitted over the natural stump, and screwed to it, in a manner to be as solid and useful as any of the other teeth.

This is a method which can be attended with no manner of inconvenience, provided it be properly executed, in the manner practised by the *ingenious* Mr. March, provided the nerve be destroyed, that the screw do not enter too deep into the root, and that the root itself be not already loosened. Therefore I always practise it, and prefer it to the extraction of the stump, and the precarious transplanting of another tooth, whenever the patient is willing to go to the price which a judicious execution of it deserves.

I observe, that some people, endeavoring to imitate this method, use a rivet instead of a screw, and make the patient believe that they have instantly given him a beautiful and well-fastened tooth, whilst they have only fitted a new crown to the former stump. But the rivet is not eligible, because it does not hold so well.

When it happens that the nerve cannot be perfectly destroyed, and the screw cannot be borne without pain; the crown, which is to be fitted in, is to be drilled through laterally almost even with the gums, and, after being properly placed, is to be held fast by means of ligatures, which are to be passed through these holes, and fixed to the neighboring teeth.

A caries sometimes affects the teeth, and produces the tooth-ache in a manner which cannot easily be discovered: that is, it begins in the lateral part of a tooth, where it is perfectly hidden and covered by the neighboring one.

This sort of caries often proceeds quickly, and considerably injures the teeth before it appears externally; therefore it should be carefully looked into, and obviated in due time by filing open the suspected part, and by removing entirely the infected crust. For although it is advisable to be very sparing and cautious in the use of the *file* in every other instance, this case particularly requires it, without loss of time; that the putrid and contagious matter may have no place to rest in, that it may not affect the neighboring teeth, and that there may be room for the brush or tooth-pick to enter and clear away the relics of food, which considerably promote the carious infection.

As a caries may easily be communicated from one tooth to another, and often makes considerable advances without occasioning any pain, those who are nice in the preservation of their teeth, should have them examined three or four times a-year at least; because in that case, the surgeon dentist may nip such evils in their rise, or he may judge more accurately of the nature and due treatment of each.

Where it happens that a patient is led away with the opinion that the tooth-ache attending caries may be cured by external applications, as advertised by many persons; and when he will not submit to the rational and effectual methods treated of above, we must be content with the application of sedative and camphorated pastes or tinctures to the carious part, or with the use of oil of cinnamon, or of cloves, or of spirits of turpentine, or any aromatic acrid liquor, to destroy the sensation of the nerve for the instant. Finally, where the caries has extended too far into the substance of the root, where matter is generated and likely to be retained in such cavities, where a new crown cannot be fitted, and where the pain continues even after the nerve is burnt, *extraction* is the last resource.

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## CHAPTER XV.

### *Of the Loss of Enamel, and the Tooth-ache arising from thence.*

A loss of enamel is easily detected by the eye, and is occasioned sometimes by internal disorders, sometimes by acid fruits and sweetmeats, often by long wearing, but most frequently by filing and the repeated use of certain tooth-powders, electuaries, and acid tinctures, sold for cleaning the teeth.

Whatever the cause be, the enamel once lost, as we mentioned before, never is restored, and all that can be done for the tooth-ache, arising from such an exposure of the naked nervous bony substance of the teeth, is to use palliatives, or apply the instrument at once. For the former intention, camphorated ætherial and sedative applications, if properly chosen, may be used as a temporary relief with success: at the same time also, the use of such cutting powders and corrosive tinctures must be wholly rejected, and extremes of heat or cold, and sweetmeats, and acid liquors, avoided carefully, for reasons which shall be treated of at large in the third part of this work.

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## CHAPTER XVI.

### *Of Fractures of the Teeth, and the Tooth-ache arising from thence.*

As the fracture of a tooth is occasioned by some violence, and attended with a loss of substance, it is easy to know when a tooth-ache arises from that cause.

The treatment depends on the extent, the direction, and figure of the fracture, on the symptoms which attend it, and on the choice and circumstances of the patient.

If the portion of the tooth that is broken off be small, acrid oils, sedatives, and camphorated applications, remove the sensibility of the exposed bony substance, and mitigate the pain, until custom, or the withering of the nerves which lie near the surface, renders the ordinary impressions of air, cold, and heat, tolerable to the patient; it is also advisable to cover the part for some time with some of the resinous substances mentioned before.

If the fracture be oblique, leaving sharp prominent edges which are likely to wound the lips or tongue, they are to be filed off.

When the whole or the greatest part of the crown is broken off, the nerve is to be destroyed, and a new crown fixed on, as related at page 49. If the patient does not choose the expense and trouble of this method, and if he feels no pain or uneasiness from the stump, it may be safely permitted to drop out of its own accord. But if the pain continues, or is apt to be renewed on every slight occasion, extraction is the only cure, and it should not be deferred too long; for the consequences of such delay are sometimes very alarming, and render this necessary operation impracticable without the loss of a neighboring sound tooth.

A young lady troubled with a violent tooth-ache sent for a tooth-drawer, about half a year ago, and desired to have the last tooth of the upper jaw on the right side taken out, for the pain

was seated there particularly. He immediately applied the instrument, and, as she then believed, extracted the tooth entire. But still the pain continued, and was increased to a most violent degree by the slightest impressions of cold air or food.

In about a month after the operation, the bad effects of catching cold were added to the former complaint ; the pain increased, the gums swelled, a violent inflammation seized on the muscles of the face and neck on the affected side, and the sub-maxillary glands became hard, painful, and greatly enlarged. These symptoms continued without abatement for some days, and then produced a collection of matter in the affected glands. A surgeon was sent for ; he traced out the source of the disorder, and knowing that a cure could scarcely be obtained without the removal of the stump, which he judged to be still remaining, he was pleased to send for me. In the mean time he did not neglect to make an opening low down in the neck, to drain away the matter which was collected to a considerable quantity in the above mentioned glands and muscles. When I waited on the lady, the inflammation, which had long affected the muscles of the cheek and jaw, was not yet considerably abated, the mouth could not be opened wide enough to admit my finger, or to allow a proper view of the parts, and I was obliged to content myself with examining by the help of a reflected *tooth-probe*, by which I satisfied myself that a stump left behind in the operation performed by the tooth-drawer, was the sole cause of all these symptoms, agreeably to the opinion of the surgeon : it was necessary therefore to extract it at all events. As the jaws could not be opened wide enough to admit the instrument in a proper direction, and as it was impossible to extract the stump without removing the neighboring tooth which stood in the way, I took out both before I withdrew my hand. About a fortnight after this, I called to see the patient again, and found that the inflammation had subsided soon after the operation, and the disordered gland was in a condition to heal ; but she told me that a violent erysipelas seized on her whole face, and endangered her life, in some days after the operation.

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## CHAPTER XVII.

### *Of the Tooth-ache and other Disorders, arising from the Last Dentition.*

To avoid repetition, I find it most convenient to refer the treatment of disorders arising from dentition in young children to the third part of this work : I shall therefore only consider the last dentition in this place.

The dentes sapientiæ, on account of their great size and broadness at the extremity, and on account of the thickness and solidity of the gums at the time of puberty, are not protruded without a considerable elevation and tension of these parts. It happens also, that the dens sapientiæ of one jaw often grows to the level of the neighboring teeth, long before the corresponding opposite wise-tooth has made its passage through the gums; wherefore the gums must necessarily be bruised and wounded as often as the patient attempts to chew; and this concurring with the circumstances related above, produces violent and sometimes wide extended inflammations of the gums and muscles of the face, and tooth-ache, and not unfrequently abscesses, which break externally.

Nothing is more easily distinguished than this disorder, because it happens at a certain age, and seldom comes on without the patient's being well convinced by gradual advances that a new tooth is the cause.

If the tooth is almost protruded, if the gums are considerably raised, and the inflammation not very violent or extensive, the pain may be presently removed by cutting the gum quite down to the tooth, with a *large crucial* incision, to prevent a speedy re-union. But when the tumor is very large, when the inflammation has extended itself to the cheek and face, and muscles that close the jaws, so as to prevent their being opened wide, bleeding, purging, and emollient cataplasms must be used, and the mouth washed with attenuating liquors, until it can be opened sufficiently to admit the instrument, and until the parts have returned to their *natural situation*. Then a crucial incision should be made, large and deep enough, with the bistoury or fleam, to give the tooth a free passage. I say the parts should be brought to their natural situation previous to this operation, because an inflammation affects the soft muscles of the cheeks, and those that close the jaws, more considerably than the gums, and throws them out of their natural place so far, that I have known a patient to have received a considerable cut in the cheek, close by the teeth, which was intended for the affected gums. The division of the gums also should be deep and complete, otherwise they are apt to re-unite; or the slender slips which may have escaped the knife, and which lie over the tooth, suffering now a greater tension than before, are found to continue the pain and inflammation for a considerable time.

## CHAPTER XVIII.

*Of the Disorder which we express by saying the teeth are of an edge.*

ALTHOUGH our language does not furnish a *proper* name for this affection of the teeth, it is well known, and very frequent, especially among children who are fond of eating vast quantities of acid or acerb fruits.

It is also observed to proceed from certain internal diseases, from hysterical affections, from bilious and putrid diseases, and long continued salivation; but the most troublesome and lasting kind of it, is owing to a loss of enamel.

This painful affection is chiefly felt when we attempt to chew; and unless we admit that the solid substance of the teeth is extremely sensible of certain sorts of stimuli, whilst it is insensible of other impressions which appear equally strong, it is very hard to explain how the sensation is brought about. To refer it to the gums explains nothing, for certain sounds have the same effect, and the disorder, when it arises from internal causes, may often be alleviated by rubbing the tops of the teeth with a dry towel; and the tooth-edge of children is removed by applying sorrel leaves in the same manner; which, although acid and acerb, remove the disorder left by acid and acerb apples, currants, gooseberries, or other fruits.

That sort of tooth-edge which arises from internal disorders, ceases with the general cause which produced it, and is therefore entirely the object of medical practice; that which arises from the use of acids and acerb fruits is to be cured by chewing sorrel leaves; and that which is owing to loss of enamel, particularly in cold weather, is relieved by keeping warm water in the mouth for some time, or by applying spirituous and acrid things, and by protecting the teeth from the impressions of air, cold and saccharine or acid food.

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CHAPTER XIX.

*Of the Intermittent or Aguish Tooth-ache.*

IT happens frequently that a tooth-ache returns at stated intervals, and has the same remissions as are observable in intermittent fevers.

The very idea of intermission and that of giving Peruvian bark, are so intimately connected in modern practice, that I have a hundred times seen an intermittent tooth-ache treated with this

medicine for several months, which has afterwards been cured in three minutes, by the extraction of a carious tooth.

I will not presume to say that an intermittent fever has never shewn itself under this form, independent of any topical disorder of the pained teeth; nor will I pretend to explain why the aching of a carious tooth should cease and return at stated intervals. But I can safely affirm that I never heard of a lasting intermittent tooth-ache cured by the bark, nor have I seen one instance where the pain could not be referred to some more probable and demonstrable cause than that to which it is generally attributed; and I have cured numbers, where the bark had failed, by extracting a carious tooth, sometimes in the seat of pain, at other times in the opposite jaw, or at a considerable distance in the same jaw. Nor do I think that an intermission, and regular approach of pain, at stated intervals, is a singular appearance, or probable indication of that species of fever which is cured by bark: for, in the human system, nature universally affects stated periods of operation, and seems to be led remarkably by habit. Thus we grow hungry and sleepy at stated hours; epilepsies and madness, and some hysterick fits return regularly: thus, the asthma, whooping cough, and hectic fever, are most violent at stated hours: thus, wounds give most pain, and disorders in general grow worse towards the evening; then, why may not the pain of a carious tooth observe some order in its recess and return?

The most frequent cause of deception in this case has been, that the teeth in the pained part have been found perfectly free from every appearance of topical disease; and the observer, not knowing that a carious tooth at a distance may produce such symptoms, never searches farther, but resolves that the intermittent tooth-ache *shall* be treated like the intermittent fever.

A lady about thirty years of age, in the winter of the year 1766, was seized with a pain in the teeth of the lower jaw, which extended equally over the whole set, but was not accompanied with any remarkable degree of inflammation. She sent for her apothecary, related her complaint, and added that she had reason to suspect a cold to have been the cause of it. Resting too much upon this, he took it to be a defluxion, or a *humour falling on the gums*; accordingly he ordered purges and cooling medicines, and laid on blisters behind the ears. This treatment was continued upwards of ten days to no effect, except that the pain now became intermittent, departing in the day-time, but returning at night with double violence, and thereby depriving her of rest. Having remarked this change, he agreed with the patient in suspecting that he had mistaken the case at first; and now that the disorder began to show itself under its proper type, there remained no

doubt with him of its being speedily cured by the *bark*. The *bark* was given in various forms for upwards of a month, the pain continued, and the patient would take no more medicine, but resolved to send for me.

It was some time before I could discover any thing in her teeth or gums, to which a pain so lasting and obstinate could easily be referred. Observing, however, that the teeth were dirty, and in many places had their interstices quite filled up with slough, for want of being used, for the patient could not chew hard food ever since the beginning of the complaint, I thought it necessary to clean them well, and to examine more narrowly before I should confess my ignorance of the cause of her complaints. When I came to clean the last molaris on the right side, the instrument catched in a small carious interstice, close by the next tooth on the outside, and then I plainly saw the source of all that I have related above.

Having told the patient what I thought on the occasion, she was eager to have the carious tooth taken out immediately. I complied; the pain ceased in a few minutes after the operation, and never returned since that time.

Although cases of the intermittent tooth-ache occur every day, this furnishes more ground for observation than any other that ever has fallen under my care; for it is very unaccountable how a whole set of teeth could be so long affected by so slight a cause, whilst a wide extended caries is often seen to produce no pain at all. The similarity also between this case and the continued fevers which become intermittent, is remarkable, especially as it arose from a treatment which is apt to have a like effect in febrile cases. The constant return of the pain at night, particularly, is pretty singular; and the difficulty which I found in discovering the seat of the disorder, should teach those who are applied to in cases of this kind, that no man can detect a slight caries of the side of a tooth, unless the parts are perfectly clean, unless he uses proper instruments for the purpose, and unless his manner of examining is better than what is usually practised: for most people content themselves with looking at the upper surface of the teeth, and never consider what may lie hid on either side, under the slough, which constantly attends such disorders of them as prevent mastication.

## CHAPTER XX.

*Of Soreness, Softness, and Bleeding of the Gums, of Worms of the Teeth, of Stinking Breath, and Lost Palate.*

SORENESS, sponginess, and bleeding of the gums, generally arise from scurvy, venereal infection, or putrid fevers, and are cured by general treatment of the original disease, by the frequent application of astringents and antiseptics, and by scarifications, when it is necessary to give vent to the over-charged vessels, or acrid matter.

The use of the brush, in cases of this kind, is condemned by some theoretical reasoners; but experience shows that nothing conduces to the restoration and solidity of the gums more than frequent brushing and cleaning.

Worms of the teeth, although talked of by some authors, are not to be seen in practice; but the fungous excrescences which rise out of the cavities of carious teeth, and which are taken for worms even at this day, occur frequently, and are to be treated with the cautery.

A stinking breath attends external foulness of the teeth, caries and purulent cavities of them, scorbutic or ulcerated gums, and the long lodgment of little scraps of aliment in the interstices, occasioned by the recess of the gums, the use of hard tooth-picks, and a bad arrangement of the teeth. The methods of cure can easily be deduced from what is said on each of these heads respectively.

Disorders of the teeth, as well as other more general ones of the whole system, sometimes bring on a caries of the palate bones; in consequence of which the food, in chewing, is apt to pass into the nose, and the speech becomes disagreeable. When these thin bones are once lost, they never are regenerated, and an artificial palate is the only remedy.

This is artfully contrived, and fitted in various ways, agreeable to the extent, situation, and other circumstances of the diseased aperture. But as I have all along avoided the description of instruments, devices, and operations, I shall not at present enter into any detail of *this* contrivance.

Before we finish this little sketch of the treatment of disorders to which the teeth and neighboring parts are exposed, it is necessary to remark that, for the sake of being easily understood, I have all along described and considered them in their most simple state, without representing the various combinations and complications of them, which occur in practice, and the equivocancy of the diagnostic signs, which I have affixed to each sort, when two or three diseases, uniting, confuse the common order, and produce new varieties.

The reader, therefore, will please to observe that the regular appearance which we have given to the disorders treated of above, is not meant to bestow on the subject a greater air of certainty than it deserves, nor to make him believe that he will find things precisely as we represent them, in every instance, or that he may meet with no cases besides those we have treated of. It is intended only to assist him in thinking and reasoning methodically, to furnish him with matter and practical discoveries, and with a line which may serve to guide him through the irregularities, intricacies, and doubts which occur in practice.

## PART III.

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### CHAPTER I.

*The Care and Treatment of the Teeth and Gums, to prevent Diseases and Deformities of them, and to restore and preserve their Beauty.*

#### PRELIMINARY DISCOURSE.

BEFORE I attempt to teach how diseases and deformities of the teeth are to be prevented; before I venture to oppose the unfair and dangerous practices which prevail at this time, or to explain how the trouble and expense which are usually bestowed in preserving the beauty of the teeth, may be more advantageously and judiciously applied, and reduced within such bounds as will better suit the convenience of the people; I must beg leave to throw myself on the candor and justice of the public, and to entreat that my endeavors may be received with *indulgence*, as I have offered them with *good intent*. For I am not insensible of the jealousies and animosities to which a man is exposed, who reduces to order and fairly teaches an art that has been as obscure as its professors, and branched by crafty and illiberal men into various pretended mysteries; and in attempting to prevent the impositions by which a few interested individuals acquire considerable sums of money, I must expect to be followed with the enmity and malice of their party, as much as if I had subverted some useful branch of trade.

But I hope the candid and discerning part of my readers will observe, that a man who undertakes a work of this kind, is bound in justice to tell what is hurtful, as well as what is serviceable; they will consider that he does not act on selfish principles only, who teaches how people may obviate a number of those evils which are the chief sources of his own profit; who opposes fruitless expense, extortion, and deceit; who affects no secrets or peculiar excellence, nor obtrudes upon the credulous any specific compositions or nostrums; and finally, who endeavors to make his art appear the fit study of judicious men, and not the trade of mountebanks, valets de chambre, and nostrum mongers; wishing

by his example to encourage others to communicate the improvements which may be made from time to time, in the same candid, liberal manner as is observed by physicians and surgeons of repute.

As the health and beauty of the teeth depend, in a great measure, on the care and treatment of them in early life, we shall begin this part with the first dentition, then we shall treat of the second, and afterwards successively of irregularities of the teeth.

Of the reduction of them by ligature.

Of the use and abuse of filing.

Of the methods of preserving the whiteness and polish of the teeth.

Of acids, sweets, violent efforts, picking the teeth, smoking, &c.

Of the care of the teeth in advanced age. And,

Of artificial sets of teeth.

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## CHAPTER II.

### *Of the First Dentition.*

FROM the third month to the second year, the protrusion of the teeth cannot fail to be attended with some degree of uneasiness, pain, and inflammation of the gums, on account of the continued state of tension in which they are kept, and the unremitting irritation occasioned by the sharp edges underneath.

If, during this time, any general febrile disorders should concur, or any other cause which is apt to increase the inflammation of these parts, and the irritability of the nervous system, the inflammation is turned to ulcers, or extends itself to the muscles of the face, to the salivary glands, and other parts, producing abscesses and a variety of disorders. Hence slavering, restlessness, headaches, pains in the ears, parotids, inflammatory and hectic fevers, rickets, convulsions, vomiting, purging, and even the death of almost one half of the children that are lost before the second year.\*

But without departing from our present purpose, it is constantly observed, that dentition causes inflammation, that inflammation, if violent and neglected, causes ulcers and abscesses, and these not only can injure the growing teeth, but also the tender stamina which lie beneath to supply a second dentition.

\* Those who judge of the fatality of disorders by the bills of mortality, will imagine perhaps that this computation is greatly overstretched. But it is to be observed, that most of the deaths imputed to convulsive, febrile, hectic, and ricketty disorders, are to be taken into this account, because they almost universally arise from dentition at this time of life.

Hence it appears, that the treatment of the first dentition at once concerns the health and life of the child, and the soundness and beauty of all the teeth which he has already grown, or ever is to have afterwards; and nothing can be more short-sighted and erroneous than the notion that the first teeth require no care, because they only last to the seventh year.

It is highly necessary, therefore, to watch carefully each successive protrusion of the milk-teeth, to mitigate the inflammation, to alleviate the pain, and to remove every impediment.

For these purposes, the body should be kept open with gentle purges, when necessary, mild opiates should be given at night, when the pain occasions restlessness; and above all, the gums should be divided in the part which is most prominent and raised by the pressure of the growing tooth. This incision should be made early on the first appearance of inflammation or fever, provided the operator is assured, by the age of the patient, and other considerations, deducible from what has been said in the first part of this work, that the tooth is perfectly formed, and not far distant from the surface of the gums. For it is trifling with the disease, and a timidity only founded on inexperience, to defer the operation, as is commonly done, until the gums are considerably elevated and pointed, since the chief danger and pain are then at an end, and nature is sufficient for the purpose.

In making this incision, some judgment is necessary to hit exactly the perpendicular line of the rising tooth; otherwise it will be of no use, and the tooth will take another course. The incision should likewise be made in the line of the edge of the tooth, and at the same time sufficiently large and deep, that it may not close quickly, and that no slips may be left in the way uncut. After this, the gums should be constantly moistened with a little milk, mixed with a decoction of poppy heads, to lessen the sensation and pain; and as the free discharge of saliva is found to give some relief, a little china orange juice may be added occasionally, as soon as it can be used without exciting pain in the extremities of the divided vessels.

As to the custom of encouraging children to chew upon coral, wax, and such like bodies, I am of opinion that it is always either hurtful or useless: for when the gums are not inflamed, the work should be committed entirely to nature, and not to the impatient, capricious fancy of an infant, who, guided only by the feelings of the present moment, bruises the gums against the sharp edge underneath, and brings on inflammations, which would not perhaps have happened were the work permitted to be done by slow and insensible degrees.

But when the parts are already inflamed, most certainly such

pressure, irritation, and wounding of them, as happen in biting a hard body, must increase every evil; I am therefore for leaving the whole to nature, whilst she is indulgent, or for making a free passage at once, as directed above, when it is necessary. I think also the *nurses* act very imprudently, who endeavor to cut the gums with their *nails*, or a sixpenny-piece, as nothing can be more evidently erroneous than the common notion that it is safer to cut them in this manner, than with the *lancet*: it is to be hoped, therefore, such practices will not be continued.

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### CHAPTER III.

#### *The Care and Treatment of the Second Dentition.*

It is observable, that in the first dentition, the teeth are seldom or never discolored, ill placed, or subject to any pain, except what arises from the cutting of the gums. But in the second dentition it happens otherwise; because the first stamina, whilst they lie under the milk-teeth, are frequently affected and even destroyed by the inflammations, suppurations, and other disorders occasioned by the first dentition; because, in their tender, yielding state, they are often furrowed and indented by the pressure of the milk-teeth, stunted in their growth, thrown out of their proper direction, and sometimes turned in their sockets, so as to leave interstices, in which small portions of food are apt to lodge and rot, and forward the production of tartarous concretions, caries, &c.

The second dentition, therefore, requires as much care as the first, and indeed as frequent observation of its progress.

After the sixth year, the milk-teeth are gradually urged by the set underneath, their roots are destroyed by the constant pressure, and then the bodies easily give way, without pain, in the ordinary course. When it happens that the roots of the milk-teeth are stronger and harder than usual, and that the succeeding set is soft and feeble, the milk-teeth retain their places, and last to old age; if the new growth is vigorous, but yet finds the milk-teeth too hard and firm to be expelled, it takes a new course, and sliding by them, emerges above the gums, on the outer or inner side, forming a double row in one or both jaws, sometimes complete through the whole anterior arch, sometimes only double in one, two, or three places; and this is the true cause of odd *supernumerary teeth*, or *double rows*. Sometimes the resistance or pressure of the milk-teeth only produces indentures, or hurts the shape of the succeeding set; but the most common evil arising from neglected dentition is the unevenness or irregular position of the teeth, which happens when the milk-teeth are pushed out by the

succeeding set; but not without having first given such oblique resistance, as to throw them out of the just and symmetrical order in which nature had kindly placed them.

It is well known that some of the anterior teeth come forth much earlier than the others; and formerly we observed, that the anterior teeth in the second dentition are considerably larger than the milk-teeth of the same part, at the same time that the first and second molares of the first dentition are larger than those of the second dentition which succeed them. Hence it happens, that a fore tooth of the second dentition has not only to encounter with that which lies immediately over it, but also with one or both of the neighboring ones: and if these are not yet ripe for shedding, or if they are permitted to remain too long, the emerging tooth must either be thrown out of order, or it must be stunted and indented by rising into a very narrow space. These, I say, are the true causes of snaggled, rough, and indented teeth; and were parents and governesses duly informed of the importance of such early care as I endeavor to recommend, I am certain the usual negligence on this occasion would not be of long continuance, nor would disordered, ill set, or discolored teeth be seen so often in advanced life as at present.

Such deformities are easily obviated, although not easily cured; for if a child, at his sixth or seventh year, is put under the care of a person who is competently versed in anatomy, and the nature and progress of this dentition, he will determine what teeth are first to be expected; and by the feel, position, and color of the milk-teeth, he will be able to judge whether they should be removed immediately, or when they may safely be left for a longer time. This may likewise with some certainty be determined, even by the parents or governesses, in the following manner.

The second dentition comes nearly in the same progressive order as the first; and from what has been said in the first part of this work, it is easy to ascertain what teeth are to be expected and assisted first, and what are the common intervals between the successive protrusions of the rest, the whole taking six or seven years.

Now, since it happens that the roots of the milk-teeth are obliterated and destroyed by the pressure of the set underneath, long before the time of shedding, provided things go on in the proper course, it is to be expected that a milk-tooth, about the ordinary time for its falling out, should be somewhat less firmly fixed in its socket than a tooth whose root is long, and well supported. I do not mean that it should at this time be very loose, or that its motion should be distinguishable to the eye, when it is forced backward or forward by the fingers; but that it should discover,

to a nice touch, such a degree of instability as can be judged not to belong to a long rooted, well fixed tooth.

In this manner, I say, it may be known when the milk-tooth has lost its root, when it is not very likely to oppose the growth of that which lies under it, nor to throw it into a wrong direction, and how long the case may safely be committed to nature.

But if, at the ordinary time of this second dentition, no degree of looseness can be felt even in the front incisors, which generally fall first, it is a sign that the growth of the set underneath does not proceed with vigor, and that the adhesion and firmness of the milk-teeth overmatch its protruding power.

In this case, a prudent and well-timed extraction of the milk-teeth, at proper intervals, insures a quicker growth of the succeeding set, and a beautiful arrangement of them; because all oblique pressure or resistance is removed.

Some people, who have committed the care of their children, in due time, to a surgeon dentist, and yet have not obtained for them the advantages expected, will reply on this occasion, that the extraction of the milk-teeth and all the care of the surgeon dentist are of little use. It is necessary to observe, therefore, that the failure of success has not been owing to the universal defect or inutility of the art, but to the timidity of the artist, or to his not being acquainted with the fact related in page 11. A fact which has never, before this time, been duly attended to, or even talked of by any author or practitioner, so far as I can learn.

Now, if what I have said on that occasion, be admitted for truth, it is plain that the common practice of removing a single milk-tooth, to make way for the young tooth that lies under it, is not sufficient to insure success: for, since the fore teeth of the second dentition, on account of their increased bulk, must and *do* edge away towards the molares, in order to encourage the free and regular growth of one front incisor, it is absolutely necessary to remove not only the milk-incisor which stands fairly over it, but also the lateral incisor which lies over it *in part*; and so on for the rest progressively. I say, wherever a proper use is made of this observation, neither the patient nor the dentist will be disappointed.

But great caution is necessary here; for it is to be considered that the stamina of a second set have, in some cases, been destroyed by preceding disorders, and then it is better to leave the milk-teeth, which sometimes last to old age, than to rob the patient of their use and ornament.

Such a case, however, is very rare, seldom exceeds to above one tooth, and cannot lead a judicious dentist into considerable error; for the first tooth extracted shows, by the state of its nerve and root, whether there is another underneath or not; and if the

doctrine of a third set of stamina has any truth, this gives it the fairest opportunity of coming to maturity.

When the milk-teeth, about the sixth or seventh year, from being even and well set, begin to turn irregular and snaggled, it is plain to demonstration, that the succeeding set does not press on their roots in the proper direction, and that such an oblique action and re-action is as likely to throw the new set out of order, as it has evidently affected that whose irregularities are visible.

So soon as this is perceived, whether it be in the fifth, or in the eighth, or any intermediate year, every milk-tooth, so departing from its natural position, should be constantly extracted, that the young tooth beneath may no longer be urged obliquely, but that it may be free to rise in just and proper order.

In drawing these teeth, great care should be taken to make use of proper instruments, and to apply them in a judicious manner—the only security against breaking the root, or the edge of the socket, or tearing or bruising the gums; for any error committed here, endangers the young shooting teeth, which may easily be disordered or destroyed by inflammation, or purulent matter falling on the socket and surrounding membranes.

Thus, in early life, we may be preserved from a deficiency of teeth, from double rows, from supernumerary teeth standing obliquely against the lips outwardly, or against the tongue within, and thereby occasioning ulcers and constant uneasiness, exclusive of the deformity. Thus we may, in general, be preserved from diseased, stunted, indented, and discolored teeth; for these are the consequences of inflammations, suppurations, pressure, and obstruction, which we have taught to obviate. And finally, we thus prevent that want of symmetry and regularity of the teeth, which not only robs the countenance of its greatest ornament, but also gives rise to discoloring tartarous concretions, and a variety of evils.

#### CHAPTER IV.

#### *Of Irregularities of the Teeth, and the Reduction of them by Ligature.*

IRREGULARITIES of the teeth are extremely frequent, where none of the above mentioned precautions have been taken, and where the second as well as the first dentition has been neglected as a matter of no concern; it is often required, therefore, to correct by *art*, what at first might easily have been prevented.

To bring teeth which are ill set into beautiful order, at any time of life, is promised every day in the public papers, with the

greatest assurance, by several people who profess themselves dentists; and I am afraid that there are people enough to believe such advertisements, and to accuse every man of ignorance, who should affirm that it is impossible. Yet, notwithstanding all this, I will freely own that I never have, nor ever will attempt this ingenious practice upon *grown people*; for reasons which I shall assign, after having first shown the different methods of it.

The first is to pass a gold wire or silken ligature from the neighboring teeth on either side, in such a manner as to press upon that which stands out of the line, in a direction which shall tend to reduce it.

The second is to fix a thin, elastic gold plate, of the breadth of a watch-spring, on that side of the tooth which recedes most from the proper line, and then to fasten the ends of it to the teeth on either side, so that the bent of the spring may tend to press the irregular tooth back to its place. This, and the former contrivance, may be applied where one or more teeth incline inwards, as well as when they project externally.

The next method is not quite so gentle, and consists in breaking the teeth into order, by means of a strong pair of crooked pliers, after which the ligature is to be applied.

The last is, to file them into order.

In advanced age, it is well known, that the teeth are so deeply and firmly fixed in the substance of the jaw-bone, that it requires a considerable power to force them out of their places, and that none of the bones, at this period, will yield to slight, continued pressure, in the same manner as the tender, growing bones of children will do. But without a yielding of the bony sides of the sockets, or of the flinty substance of the teeth, how is it possible to bring a tooth which projects outward, or inclines to the inside, into the proper line? or supposing this were feasible, if the pliant bones of children require a considerable length of time to effect such alterations, what would be the time necessary on this occasion? what the degree of pressure? who could support such lasting uneasiness? if we may tell the truth, such notions belong to fancy, not to practice; and such promises are founded on ignorance, or intended for *deceit*.

The same observations apply to the second method, or to those that pretend to have used the elastic plate successfully.

As to the third, it is such a treatment as need not be opposed; because it is not credible that any grown person is so easily persuaded, and so regardless of pain, as to submit to the trial. But supposing the case were otherwise, it is well known that a tooth in a grown person cannot admit of any considerable change of situation, without being raised out of the socket; so that whilst the operator

brings it into the line on one hand, he raises it above the level on the other ; he destroys its connections, exposes it to looseness, pain and decay, and makes it incapable of bearing the ordinary impressions in chewing ; an evil much greater than the total loss of a tooth.

As to *filing* the teeth into proper shape, size and order, I know that it is practised every day, and shall therefore consider it more at large, after I have first pointed out some instances where the reduction of the teeth is practicable and safe, and which serve as a pretext for the exaggerated accounts, and the incredible pretensions of those who promise to succeed at all times.

Between the seventh and twelfth year, whilst the teeth are growing, and the sockets in a condition to yield, by degrees, to any constant pressure, if the edge of a tooth stands out of its proper direction, it may oftentimes be brought back, provided the patient will bear a ligature, as described above, to continue on for a long time, and to be tightened occasionally ; provided likewise that the projection of the tooth out of its required direction, be not very considerable, and that the pressure do not fall solely on the two neighboring teeth ; for it always should be divided by throwing a few turns of the wire or ligature over some of those that stand at a distance. The use of the elastic plate is more inconvenient to the patient, but not more effectual than this method ; and the application of instruments, to force the teeth at once into order, is extremely dangerous at any age ; since it is more likely to loosen them, and make them fall, than to give regularity and beauty.

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## CHAPTER V.

### *Of the Use and Abuse of Filing to remove Irregularities of the Teeth.*

THERE are many instances in which it is advisable and safe, as well as ornamental, to file the teeth ; but as it is usually practised, nothing can be more pernicious.

Since it cannot be supposed that any man is so lost to shame and humanity, as to expose his patient to pain and inconvenience during life, merely for the sake of a trifling fee, the indiscriminate filing of teeth, so common at present, should be imputed only to ignorance, and may, I hope, be checked, by placing the subject in a clear light, and by drawing the line to distinguish where it may, and where it may not be practised with safety.

1. In people far advanced in years, the teeth may be filed into order without any inconvenience ; because the nerves are lost,

the teeth can feel no pain in the operation, nor afterwards from cold, acids, or sweets, and because they are not then so much subject to caries or decay.

2. Where a tooth projects beyond the common level, and hinders the rest from meeting equally, or receives, on itself alone, all the pressure which should fall divided on a whole set, there, filing is necessary, at any age, to remove the greater evil.

3. Filing is necessary and advisable to remove sharp points, occasioned by fracture or otherwise, which irritate and wound the lips and tongue; because, in this case, the bony part of the tooth is already exposed, and cutting off the sharp prominences cannot make it more liable to caries or pain than it would otherwise have been.

4. Where a tooth points obliquely against the tongue, or against the lips, as often happens on account of the resistance of the milk-teeth, it is necessary to round the edge by filing, to prevent its wounding the soft parts.

5. When the edges of the fore teeth are uncommonly sharp and thin, and therefore apt to splinter, it is very proper to file them down, to give them a more obtuse and durable edge.

6. Filing is likewise advisable to remove caries, to prepare a tooth for the reception of a new crown, and in a few similar cases, related in the second part of this treatise.

7. When the teeth stand irregularly, and are too broad to admit of being reduced to one uniform line, filing between them, to lessen their size, may be practised to a certain degree; but great care should be taken not to cut away the enamel totally, as is too often practised on this occasion.

If a man had no feeling, nor any other use for his teeth but for the ornament of his countenance, I should not limit the use of the file to these cases only. But since most people, from infancy to middle-age, feel insufferable pain the very moment the file touches the bony substance: and since this pain must be very often repeated, because each successive surface of the osseous substance must have some time to wither, and lose a part of its sensibility, before it can admit of filing beyond a certain depth; since it happens, likewise, that the enamel once removed, is never regenerated, that a tooth in this naked state is for a long time affected with pain from the slightest impressions of cold, acids, sweets, &c.; that it wears away quickly, and is very much subject to decay; I cannot join to support the common practice of indiscriminate filing; I think it should be confined to the cases above related, for I believe it is advisable in these only.

Hence it is, that I so frequently refuse to perform this ornamental operation for my patients, and that I have often advised young

people, who have credulously listened to advertisements and promises of this kind, never to barter a sure and valuable blessing for such a painful, dangerous, short-lived ornament: for ill set or irregular teeth may last healthy and unpained to the latest period of life, and the deformity in general is not very great, provided they are kept clean, white, and polished.

The cautions which are to be observed in filing, and the methods of reducing the projecting teeth to one uniform edge, so that the upper and under rows may touch every where, when the jaws are approached, I shall not touch on at present; having through the whole, endeavored not to swell this work with descriptions which are only intelligible to operators, who ought to learn the mechanical part of this art from experience and not from books. I will not, however, conclude this chapter without observing, that the people of this country, who practise on the teeth, are not quite so liberal in their promises, nor so fond of cutting and filing, as the *gentlemen* who quit the continent *for our sakes*, and walk in a more exalted sphere, piquing themselves on the dignity of having served *Counts* and *Marquises* in the station of *valets de chambre*, and of having seen the art of filing *practised in twenty provinces*.

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## CHAPTER VI.

### *The Method of Preserving the Whiteness and Polish of the Teeth.*

THE generation and texture of the tartarous and other matters, which discolor the teeth, and destroy the shining polish of the enamel, and the evils which attend long neglected complaints of this kind, together with the methods of cure, we have considered pretty fully in the second part of this work; but referred the preventive treatment, and all that concerns the beauty of the teeth, to this place.

The methods of whitening the teeth, and of preserving them from tartarous concretions, or discoloring slough, are very different and seem to concur only in this one point—that they all are extremely pernicious, as they are now used, excepting only where the tartarous matter is removed by the instrument; for all act directly for the destruction of the enamel, either by *mechanical grinding*, or *chemical dissolution*.

These of the former sort, whether sold under the name of a powder, electuary, or opiate, whether whitened or darkened, or otherwise colored by certain additions, are always composed of pumice-stone, emery, or some other cutting powder. These of the latter sort, however tinged with *sanguis draconis*, cochineal, alkanet-root, or other drugs; and however changed in taste by

spirituous, camphorated, and various mixtures, are always composed of *mineral acids*, particularly of vitriolic; and although, in *modesty*, they are called tinctures, &c., they are really very powerful menstrua to soften and destroy the enamel.

That the powders which are usually sold for cleaning the teeth, do, in some measure, hurt the enamel, is too obvious to need any argument; but it is not generally believed that they are so pernicious, as to deserve particular notice or censure. I thought, therefore, it would not be improper to put this matter to the test, and to ascertain, as nearly as possible, in what time, and how far they are or are not destructive.

I fastened in a vice a sound and well enamelled human tooth, placing the convex side uppermost: I then took a brush, wetted and charged with a certain tooth-powder, which I had bought for the purpose, and in less than an hour, by rubbing quickly with this brush and powder, I wore away entirely the enamel of the part which was exposed to their action.

The like experiment I repeated with all the different tooth-powders, and found the same effects, varied only a little in time, according to the coarseness or fineness of the powder, and the different hardness of the enamel.

Now, it is well known, that a number of people brush their teeth with powders of this kind two or three times a-week; and if we allow that the brush and powder generally act on the front teeth briskly for one fourth of a minute each time, in the space of a month they act three minutes, or in two years seventy-two minutes; that is to say, in the space of two years, the teeth have undergone a great deal more brushing than was found sufficient to destroy the finest and best enamel.

Hence those that brush with powders only once a-week do not destroy the enamel in less than five or six years; and those who use powders but rarely, can never be brought to believe, that their teeth are injured by them, because the destruction creeps on too slowly to be observed.

To all this, I presume, it will be objected, that the enamel is known to increase in thickness, from childhood to puberty, although some part of the original growth is certainly worn away in the mean time; and since it evidently appears from thence to admit of growth and repair, it may do so likewise at a more advanced age, and supply whatever is lost by the use of tooth-powders. It may be added too, that although it seldom or never is restored in a part where it has once been totally separated from the bone, yet it may, like the *bark of trees*, receive new layers, and be repaired so long as any part of its internal substance remains unhurt beneath. But all this reasoning is founded upon

suppositions, which are not yet countenanced by any certain evidence, and therefore cannot be opposed to daily observations and matters of fact, which teach us that the enamel wears away quickly, even in mastication, after the twentieth or thirtieth year, and that it is totally lost, at a very early time of life, in those who use tooth-powders imprudently.

Some people, who have been convinced of this truth by striking examples, imagine that the danger may be avoided by using a cloth instead of a brush. To try whether this notion was well founded or not, I took a well enamelled human tooth, and fixing it in a vice, in the manner mentioned above, I rubbed it smartly with a cloth dipped in tooth-powder, for half an hour, by which time I found the enamel quite worn away. Having repeated the same experiment several times, I found that the cloth destroys the enamel in half the time which was found requisite for this purpose with the brush : for which reason, and because it does not enter the interstices of the teeth, it is evidently more destructive, and much less effectual in removing the tartar.

Having thus endeavored to explain the action of tooth-powders, and pointed out the evils occasioned by the indiscriminate use of them, it is necessary, for the instruction of my readers, and in justice to the people who are interested in the sale of such things, to show where they may be applied without any danger, and how, under due restrictions, they sometimes conduce to the duration, as well as to the ornament of the teeth and gums.

1. Where the teeth are discolored with a very thin scale of tartarous matter, or by a superficial tarnishing of the enamel, the common tooth-powders may be used, until that substance is worn away, but no longer, on any account whatever.

2. After a thick tartarous crust has been removed by instruments, any tooth-powder may be applied to remove whatever slight discoloring matter still adheres to the enamel ; but when that is gone, they should be no longer continued.

3. Lastly, those who cannot brush their teeth often, or take proper care of them, for want of leisure and conveniences, may use rough tooth-powders once a month, to clear away the tartar expeditiously and completely ; because the evils arising from total neglect, with those especially who are by constitution disposed to generate tartar very quickly, are greater in general than any that can be produced by this sparing use of tooth-powders.

Tinctures for cleaning the teeth are so easily applied, so effectual, and contribute so largely to the dentist's profit, that I wish it were consistent with truth, and the safety of those who might be induced to use them, to speak in their favor, or to retract what was said in the beginning of this chapter.

The daily instances of their bad effects, and their being composed of mineral acids, have long been used as arguments against them, by impartial and good judges; but to no purpose, because these assertions have been as little credited as they have been ill supported, and they have not been conveyed to the people in so effectual and general a manner, as the plausible and artful addresses of advertising nostrum-mongers. It still remains, therefore, to clear up this matter, in a manner suitable and satisfactory to the generality of readers. It is to be observed, before we proceed farther, that some of the people who sell tinctures for the teeth and gums, keep two sorts, and make a very just distinction in the sale of them. One is given for strengthening the gums, for curing the flabbiness and bleeding of them, scorbutic ulcers, and the stinking breath occasioned by such complaints. It is generally composed of grateful resinous substances, vegetable astringents, and spirits variously flavored and colored; is a good liquor to wash with when the gums require it, and is entirely harmless, whether they want it or not.

Others sell tinctures for the teeth and gums, which they recommend, together with their tooth-powders, under one general character; thereby rendering it necessary for the patient to buy both in every case, and impossible for him to determine how many of the virtues, recited in the advertisement, belong to the tincture, how many to the powder; or whether all that is said of both does not apply with equal justice to either; although one is an innocent wash, equally as fit for the face and hands as for the mouth; whilst the other is an active dentifrice, possessed of all the grinding virtues recited above.

I say these, or such like tinctures, since they are innocent, and as good as *water* (although not quite so cheap) are not the objects of our censure; I mean only to consider that sort of tincture which is sold for whitening the teeth, &c.; and which is composed of mineral acids diluted and concealed by various artifices.

This is evident from the sour astringent taste; from the roughness and peculiar sensation of the teeth to which these tinctures are applied; from their losing these properties, and becoming neutral on the admixture of an alkali; from their effervescing with oil of tartar, as much as can be expected from an acid so much diluted, dulcified with spirits, and covered artfully by camphor, coloring drugs, &c. And lastly, from their whitening the teeth, which cannot be done *so speedily* by any menstruum except a mineral acid. Let us then examine the power and effects of mineral acids thus applied.

I put half a dozen sound and well enamelled human teeth into a glass full of spirits of nitre; in a quarter of an hour the shining

polish of the enamel was destroyed. In six or eight hours the substance of the enamel, and of the bony root of each tooth, was cut away to a considerable depth, and the enamel which still remained was so much altered, as to be easily scratched and cut with the point of a knife; in three days the teeth were totally destroyed.

I then put the same number of sound teeth into a glass full of spirits of nitre, diluted with an equal quantity of water, and placed the glass near the fire, so as to receive a heat nearly equal to that of the human body. The effect was the same as in the former experiment, with this difference only, that the solution proceeded much more slowly. The *nitrous acid*, therefore, whether strong or diluted, can destroy the enamel as well as the bony substance of the teeth, although it should be used but very sparingly, and not permitted to act for any considerable time; it is evident, likewise, that the softness, which it occasions in that part of the enamel which it has not had time to dissolve, is extremely hurtful to the polish and duration of it.

The *muriatic acid*, tried in the same manner, softens and dissolves the enamel and bony substance of a tooth, almost as powerfully as spirits of nitre: and it is remarkable, that whilst it dissolves the external surface into a ropy mucus, the internal parts are discolored to a considerable depth, and turned into a semi-transparent horney substance. Hence, perhaps, arises the bad color of the teeth so remarkable in seamen, who live on salted food, and whose blood is said to be charged with sea or ammoniacal salt.

I treated several sound teeth with the strongest *vitriolic acid* in the same way, and after a few hours found them extremely white; but neither the enamelled or bony parts seemed to be dissolved, as happened when the nitrous or marine acid was used. I let them lie, therefore, for three or four days, and even then the quantity dissolved was not considerable: but the enamel became rough, and so far altered in its texture, that I could easily scratch it with a knife; the color also, instead of being a semi-transparent white near the edges, was a dead white like that of chalk.

I then tried the same acid variously diluted, and found it to act as powerfully and directly in the same way, when mixed with six times its quantity of water, as when undiluted. It appears, therefore, that it is more effectual than the others in whitening the teeth, that it does not destroy them quite so fast, and it is judiciously chosen by those who sell tinctures for cleaning the teeth, as the least pernicious of all the mineral acids.

But although it acts slowly, the destruction, which it brings on, is not the less certain. When once the teeth lose their polish, the

tartar is constantly renewed, the acid must be as often repeated; and a few months can do effectually with the *vitriolic acid*, what a few days will effect with the nitrous or marine.

I can easily foresee that those who recommend tinctures for cleaning the teeth, will endeavor to evade these arguments by saying, that they are only used where tartar covers and defends the enamel, or that they are so much diluted as to be incapable of attacking it. But it is well known, that the edges of the teeth are very rarely covered with tartar, even in those whose teeth are very tartarous near the gums; wherefore, the exposed enamel must suffer in this part, whilst the tartar is slowly dissolved elsewhere; and it needs no argument to prove, that if oil of vitriol with six parts of water can visibly affect the enamel in two or three days, it may destroy it totally in a few years, although it should be greatly diluted beyond this proportion.

Indeed, to talk of the dilution of the acid, is a very weak evasion of the truth; because, if vitriolic acid be so greatly diluted as not to affect the enamel in a considerable space of time, it is proportionally incapable of dissolving the tartar, as I have repeatedly experienced; therefore, the strongest vitriolic acid that can be used in this way will hurt the teeth as little as the weakest, because it need not be long applied; and if the enamel be twenty times less soluble than the tartar, one certain portion of the enamel, which is exposed, will be destroyed for every twenty portions of tartar, whether it be applied weak or strong, for a minute or for a year.

Observing that one of the most celebrated tinctures for whitening the teeth lets fall an earth like that of alum, when a little alkaline liquor is added; I suppose it will be alleged, in further defence of them, that the vitriolic acid is in a neutral or aluminous state, which will not allow it to act as a pernicious solvent.

If it is no longer a solvent, how comes it to dissolve the earthy tartarous concretions of the teeth? If it can destroy these, why not the earth of the enamel too, as usual, and in a degree proportioned to its solubility? Or supposing we were to say, at once, that most tinctures for whitening the teeth are chiefly composed of alum-water and spirits, for the flavoring or coloring drugs are nothing to the purpose, will this prove them to be harmless?—Not at all.

A solution of alum mixed with spirits lets fall a great part of its earth: the acid thus forsaken, takes but slight hold of the spirit, and is ready to attack any earthy body that has an affinity with it: wherefore, alum-water and spirits, however colored or scented, form a liquor as hurtful to the teeth, as a mixture of oil of vitriol and spirits containing an equal quantity of naked acid.

Exclusive of the effects of this acid, as a solvent of the earthy parts of the enamel, there is another consideration, which is still more weighty and more demonstrative of its pernicious effects. I observe, that the enamel cracks and splinters away from the teeth of those who use acid tinctures, and is thus totally lost, long before the acid has had time to corrode it to any considerable depth: were it not improper in my business to mention names, I could recite a great many instances of this kind.

But, notwithstanding the daily proofs of this effect of the vitriolic acid, which has occurred in practice, I must own I was always willing to refer the splintering and mouldering of the enamel to other causes, even in those who used the acid tinctures: until the following experiment taught me how easily its hardness and texture may be destroyed, without any *visible loss of substance*.

If a tooth be placed on a red hot poker, and held thus over a sheet of clean paper, the enamel presently flies off in small pieces, with a crackling noise; but if it be gradually warmed and advanced to the hot part of the poker, until the bony part of the tooth begins to smoke and turn black, then the enamel does not crackle and fly to pieces so much as in the former case; and in a number of trials it may be separated almost entire from the parched bone in the form of a cup: it still retains its shape and size, but its polish is gone; its semi-transparent white is turned to a chalky white mingled with grey, occasioned by the oily smoke of the bone; and in place of a flinty hardness, it breaks between the fingers, and can easily be scratched with a knife.

That principle, therefore, which gives cohesion to the enamel, is very easily expelled, is a very small, nay, an invisible part of the whole, and may be acted on by the vitriolic acid as well as by a slight heat. Were these experiments pushed farther, it might, perhaps, be easily proved, likewise, that the nitrous and marine acids act on the earthy and all the parts of the enamel; whilst the vitriolic attacks the cementing principle chiefly, and the *earthy* one, by very slow degrees.

But the dangerous tendency of acid tinctures for whitening the teeth, does not seem to be confined to this direct action on the enamel and bony substance. For in those who have used them long, I have generally observed the connection between the teeth and gums to be greatly injured, and sometimes so far destroyed, that the corrosive liquor could easily make its way into the sockets. I will not be so positive as to say, that this was owing to the tinctures only; but I am very certain, that tinctures of this kind are particularly dangerous, where a bad state of the gums permits them to find a passage into the sockets, or to attack the teeth below the enamelled part.

These experiments and friendly hints, I formerly thought sufficient, not only to caution and instruct my readers, but likewise to effect a reformation in the composition, and mode of administering the various dentifrices; expecting to find each respective vendor of them as unwilling to persist in a known and dangerous error, as I was unwilling to descend to personal censure. But I have been disappointed: for instead of collecting from this treatise such instructions as might serve to direct them in the choice of innocent dentifrices, they have only learned to talk plausibly on a subject, of which they were totally ignorant before; and each of them repeating my observations and experiments, and kindly adopting them as his own, concludes with assuring the public, that his dentifrice contains none of "*the coarse, sharp, cutting substances* used by his brethren, and which in a course of *long and successful practice* he has found to be extremely pernicious: *His composition has nothing in it but what is of the softest and smoothest kind, free from every thing that is in the smallest degree injurious.*"

Plausible harangues and advertisements of this kind, are apt to deceive even the most sensible and judicious, whose candor and humanity will not permit them to suspect that any man, placed above the want of common sustenance, can, for the sake of a few shillings and half-crowns, repeat so audacious a falsehood, as to assert, that the substance he sells, is the "*softest, smoothest, most balsamic, most anti-scorbutic, most anti-putrefactive, most anti, &c. &c.*" whilst at the same time it contains, in considerable quantities, the very "*hard, sharp and injurious particles,*" which he condemns, and is directly calculated for the destruction instead of the preservation of the teeth.

Now, to take a middle course between the mean office of attacking each of these nostrum-venders with such direct censure, as might tend rather to ruin, than to reform them; and the greater fault, of permitting fraud and imposition to carry away the just reward of industry and merit, whilst the public is abused, and many individuals essentially injured: to avoid these extremes, I shall content myself with giving, in this second edition, such instructions as will enable every reader to examine and determine, with demonstrative certainty, whether all I have advanced on the subject of dentifrices does not apply, as generally as I expressed it: whether any of them answer to the character bestowed upon them in printed advertisements, or verbal encomiums at the time of sale. Thus every person, who considers the preservation and beauty of his teeth and gums as matters worth attention, will be prompted to examine the respective merits of these "*incomparable, most excellent, most admirable, most cele-*

*brated dentifrices ;*" and the venders will either be forced to adopt innocent and judicious compositions, or be glad to decline the present tooth-grinding trade,—instead of "*wishing (without offence) to decline the mechanical, contemptible business of drawing teeth, for the more laudable and genteel profession of selling these elegant and infallible nostrums.*"

The whole *science* or *mystery* of forming a dentifrice like those now in fashion, consists in covering and concealing the stuff which scours the teeth, by a plentiful admixture of various matters, chosen or taken at random, according to the trade, the ignorance, or caprice of the composer.

Some of them, wishing to give a medicinal appearance to their *scouring stuff*, add to it a considerable quantity of cassia lignum, and some testaceous powder; and then, by moistening the mass with syrup, or a solution of honey in water, form it into an electuary; for no other purpose, that I can conceive, except that the composer may have some grounds for making *honorable mention* of it, in his ingenious work, under the style and title of "*A medicine for the teeth,*" and "*A remedy for the teeth :*" or that he may be secure and unrivalled in the monopoly of it; having chosen such a mixture, (I will not call it a *medicine*,) as it could never enter the head of another man to use or imitate, for the purpose of cleaning and *preserving* the teeth.

Others, taught by their trade the effect of color, dress, and decent exterior, attend more to the appearance of the composition than to any other circumstance, and therefore choose to cover the active basis, consisting of emery or sand, with a considerable quantity of logwood, and some testaceous powder to increase the bulk. Substances which admit of no union; which are the most easily separated and distinguished; and such a vegetable coloring ingredient too, as is more likely to stain the lips and mouth, than to conceal the active grinding basis of the dentifrice. But why do we look for pharmaceutical knowledge or judicious composition *here?* It is almost an age since the surgeons and barbers have quitted company.

But to be serious; all the *dentifrice makers* discover as much absurdity in the choice of those substances which give the color and medicinal or artful appearance, and which cover the active basis, as they do barbarity and ignorance in the choice of the basis itself. Even the white powders, lately adopted by some for the sake of novelty and singularity, are, of all others, the most puerile deceptions, and the most preposterous compositions. Puerile, because the taste of cream of tartar, which forms a considerable part of them, is known to every one, and easily discovered; and because the bolar earth, which helps to cover the

sandy scouring stuffs, is easily separated from them. Preposterous, because cream of tartar is the strongest vegetable acid, though sold for preserving the teeth, by the very man who so loudly exclaims against sharp corrosive particles, and calls *sugar doubly corrosive*.

The ignorance, therefore, of the composers of these dentifrices, has rendered the labor of analyzing their constituent parts very easy. But since it is repugnant to the plan which I have proposed, to publish a complete analysis of each, or to point at any nostrum or nostrum-vender particularly, I shall only give one simple process, whereby the scouring, pernicious ingredient of each dentifrice may be stripped of all these medicinal and beautiful coverings, and detected by any person, however little acquainted with matters of this kind, under the plain, native form of emery, sand, rotten-stone, pounded china, crocus, pumice-stone, burnt bone, &c.

Take of any dentifrice powder or electuary, one ounce, throw it into a quart of water, stir it up, and after a few minutes pour off the water, together with the light matter which remains suspended in it: let this be repeated nine or ten times, taking care always to preserve the heavy mass, which subsides quickly to the bottom, and observing that the oftener fresh water is added, the less time is requisite or needful to be allowed for the coarse powder to subside.\*

This last then perfectly separated, by repeated ablutions, from the light ingredients, which we have pointed at above, is to be received on a piece of soft paper, and placed before the fire until it dries; then it is easily observed to consist of one or more of the sharp, cutting powders mentioned above.

As substances of this kind are daily used for grinding down steel, glass, and the hardest stones, we shall commit it to the reader to determine how far dentifrices, as now sold, are useful or pernicious; and whether the addition of powdered wood, testaceous earth, or any of the other materials which are usually added, can prevent sand, emery, and such like substances, from grinding away and destroying the enamel, any more than the admixture of a handful of flour or saw-dust with as much sand can prevent this last from scouring and grinding away the toughest metals and the hardest glass.

Whoever takes these things into consideration, together with what has been advanced, and experimentally proved, at page 70, and who reflects on the evils and deformity which follow the loss of the enamelled covering of the teeth, needs not, I think, be farther admonished against the use of these fashionable compositions,

\* Any dentifrice opiate may be treated in the same way, after having been first softened with warm water.

or more fully persuaded of the necessity of trying even the most celebrated and best puffed dentifrices, by the process related above, before he ventures to use them freely. Therefore, I shall only add, that every man who adopts this measure, serves the public as much as himself, because the venders of dentifrices, as soon as they find their customers thus disposed to examine, will, out of regard to their own interest, listen to reasonable admonition, and must resolve to offer such things only as they may honestly sell, and the buyer safely use.

Let us now proceed to teach how the beauty of the teeth may be preserved from infancy to old age, by such care and treatment as shall be free from all the dangers which belong to powders, electuaries, and tinctures.

As soon as the second teeth appear, the parents and governesses should take care to make the children wash their teeth every morning, with common water and a convenient tooth-brush; and after meals they should be accustomed to rinse the mouth, and rub the teeth with their fingers, when a brush cannot be conveniently used. Those who constantly observe such instructions, may depend upon being for ever free from tartarous matter, putrid slough, superficial discoloring, flaccid gums, and from the pain and looseness of the teeth, arising from these causes.

I know it is a very common opinion that brushes are hurtful to the gums; and the only reason which can be assigned for it is, that brushing makes the gums bleed, that it therefore seems to wound them, and disturb their connections with the teeth. It is true, no doubt, that brushing the gums will have this effect at first, with those who have not been used to it, and whose gums are soft or fungous. But where it is constantly used, instead of hurting, it gives a salutary irritation, it fills the vessels, elongates the fibres, and gives a firmness to the gums, which conduces greatly to the soundness and duration of the teeth; add to this, that the relics of food or slough of the teeth cannot be cleared away so effectually by any other method. Some people prefer the fibrous end of the prepared marsh-mallow roots, which is sold in the shops under the name of dragon's blood; but it is not by any means so good as a brush, because it cannot enter the interstices so well, because it is apt to leave its broken fibres between the teeth, because it is not durable, and above all, because it acts like a cloth, which we have shown to be hurtful.

Where the teeth have been neglected at first, and when tartarous matter has already fastened to them, after having removed it by instruments, as mentioned before, they should be rubbed for some time with a fine testaceous powder, such as I usually recommend, to remove whatever discoloring matter still remains:

then, when the enamel becomes perfectly clean, white and polished, even this fine powder should be used very sparingly, at distant intervals, and the color and smoothness are to be preserved by frequent brushing and washing.

It often happens that the enamel itself is tarnished throughout its whole substance, and that the removal of the tartar cannot give a fine color. In this case, the patient, if he be not well advised, continues the use of powders and tinctures, until the enamel is destroyed; or he goes to some ignorant operator, who, thinking the business not finished, nor his fee earned, until the teeth become white, employs his files and cutting powders, until the enamel is wholly destroyed, and until he exposes the naked tooth to a train of evils.

Having recommended, above, the use of instruments to remove tartar, in preference to any other method, it is necessary to set this matter in a proper light, and to remove a very ill grounded popular prejudice.

It is commonly imagined, that it is much safer and gentler to remove the tartar by means of tooth-powders, electuaries, and tinctures, than by means of steel instruments. To this it is only necessary to answer, that the enamel of the teeth is as hard as the hardest steel, and the edge of a steel instrument, sliding obliquely on it, can no more injure it, than the edge of a knife, applied in the same manner, can scratch a pane of glass. But that grinding powders, which cut the hardest steel, or that chemical liquors can destroy the enamel, is plain to daily observation and common sense.

The distinction also which I make between soft testaceous powders and the coarse emery or pumice-stone powders, commonly sold, is justly founded; because the former smooth the enamel, without grinding it away, after having removed the tartarous matter; but the latter cut it away quickly, and leave behind them a coarse and scratched surface, which favors the fresh growth and adherence of the same sort of matter.

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## CHAPTER VII.

### *Of Vegetable Acids, Sweetmeats, Violent Efforts, Picking the Teeth, Smoking, &c.*

HAVING treated of the mineral acids, and endeavored to restrain the excessive use of them, I think it necessary to consider the *vegetable acids* and *sugar*, in like manner; since they have often been mentioned in the preceding parts of this work, and represented as hurtful to the teeth in some of their disorders, if not in their soundest state.

It does not appear by any experiments made on the human teeth, that vegetable acids are powerful solvents of the enamel; but since they are known to act on calcareous earths,—since they are found to soften bones and the shells of eggs,—and since they can often make their way to the naked bony parts of the teeth below the enamel, I think it is very obvious, that on these principles *they* may hurt the teeth; and the roughness, tooth-edge, and pain, which they excite, joined to daily observation of their destructive effects, prove clearly that they do. Hence it happens, that the inhabitants of the West India Islands, and of other southern climates, where acid liquors and fruits are used plentifully, very seldom have good teeth.

With respect to sweet-meats, it is not easily to determine how they act on the teeth, although the disagreeable sensation excited by them, and frequent experience prove that they really are injurious.

The chemists say, that since vegetable acids destroy the teeth, sugar may do the same, because it is an acid enveloped in oil, which it may readily quit to unite with the calcareous earth of the teeth. They add, that many mild liquors dissolve hard bodies; thus mercury dissolves gold; oil dissolves brimstone, lead, and copper; the weakest acids dissolve metals and stones; water dissolves salt, or the tartarous dregs of wine; and sugared solutions, which by a little warmth may soon be turned to an acid liquor, may easily be supposed capable of dissolving and destroying the earthy basis of the teeth: since they will destroy iron or copper even before they become sensibly acid.

Whether this be true or not; whether sugar acts by softening or corroding the bony fibres, or, according to others, by affecting the nerves, and bringing on internal disorders, or else by hurting the connection with the gums; thus much is beyond all controversy,—that sugared meats or liquors, render the teeth more susceptible of pain from slight impressions of cold or chewing, and that the people who eat most sweet-meats are the most subject to disorders and deformities of the teeth. The peasants and poor farmers suffer less in this way *than those of rank and opulence*, who eat of second courses; and I am credibly informed, that in the low countries, where sugar, tea, coffee, and sweet-meats are used to excess, the people, even at an early age, are remarkable for the badness of their teeth. It is, therefore, advisable to eat of them but seldom, and alway to wash the teeth after them.

Cracking nuts is often hurtful to the teeth, by breaking the enamel; as is also the custom of some girls who cut the thread with their teeth when they sew, to prevent the trouble of taking up the scissors.

The boyish custom of raising weights with the teeth, and of carrying a table or chair in the mouth, is as dangerous as it is absurd, and therefore should not be attempted by any reasonable person.

As to the constant use of tooth-picks after meals, I am clearly of opinion that it is a very bad practice. For all tooth-picks, and particularly those that are made of metal or wood, by being often pushed between the teeth, destroy the gums, and widen the interstices, so as to furnish more convenient lodgment for the food, and render the custom of picking every day more and more necessary.

If people after a long habit cannot refrain from such practices, the tooth-picks made out of quills, or the slips of the Spanish thistle, do less injury to the gums than any others. But to those who are willing to follow the safest and most effectual methods, I recommend the use of the straight tooth-brush, which has the hair fixed in the end, somewhat like a painter's pencil. This sort of brush, if it be well made of short stiff hair, instantly removes whatever scraps of food have lodged between the teeth, and instead of hurting or pushing down the gums, gives a salutary stimulus, as we mentioned above, which encourages their growth and adhesion.

I observe in people who smoke tobacco constantly, that the enamel of the fore-teeth has many fissures, which run chiefly from the edge downwards; I am therefore inclined to think that smoking is hurtful to the teeth, although it be found serviceable in fluxions, on account of the discharge which it occasions, and on account of its sedative virtue. But whether this opinion be well founded or not, it is certain, that with those who catch the pipe between their teeth, the enamel in that part wears away remarkably, in process of time, by the constant friction of it.

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## CHAPTER VIII.

### *Of the Care and Treatment of the Teeth in old Age, and of Artificial Teeth and Gums.*

THE diseases of the jaws, which generally attend old age, are recess of the gums, prominent teeth, loose teeth, and the loss of teeth; all which, together with the various methods of obviating them, or at least of checking their speedy progress, having been already considered, to avoid repetition, I must beg the reader to collect from each respective chapter on these subjects, whatever instructions may be found necessary and applicable in the present case; I shall only add a few words concerning artificial teeth and gums.

Although artificial teeth are evidently ornamental; although they give a healthy juvenile air to the countenance, improve the tone of the voice, render pronunciation more agreeable and distinct, help mastication, and preserve the opposite teeth from growing prominent; yet, many are prejudiced against them on account of some inconveniences which are often found to attend the use of them. For they are said to become very soon yellow and dirty:—to give a stinking breath:—not to sit easy on the gums:—seldom to stand firm:—and to loosen after some time the neighboring teeth to which they are fastened. Or, the hard ligature, which is commonly used, is often seen to cut very deep into the sound teeth.

It frequently happens, no doubt, that there are just grounds for these complaints; but they are generally owing to the fault of the artist, the negligence of the patient, or the want of proper instructions.

Artificial teeth formed out of soft bone or ivory, soon lose their color, but they may be made of materials which are more durable, and will retain the polish and whiteness for a long time; and the people who wear them, should be taught to brush them often with proper powders, and to avoid as much as possible red wines and staining liquors. With these precautions, and frequent washing, they never give a disagreeable smell to the breath.

Their not sitting easy on the gums is owing to their resting unequally on them, and to their not being well hollowed and formed to answer every prominence and depression of them.

Whenever it happens that they do not stand firm, it is entirely the fault of the artist, who has not made them to fit exactly, or has applied the ligature injudiciously.

It must be acknowledged, that when an artificial piece is made too large, it is apt to bear hard on the neighboring teeth, and to strain them outwards. On the other hand, when it is made too small, the ligature draws the neighboring teeth inwards, and thence is apt to loosen them. But if an artificial tooth, or a piece consisting of several artificial teeth, is well fitted exactly to fill the void space, it rather supports the neighboring teeth, and preserves the corresponding ones of the opposite jaw from being protruded. Nor is this contradicted by the common observation, that the teeth often become loose and fall out quickly, even in those who use the best made artificial pieces, and who employ the most judicious dentists: because the same general decay or disorder, which made an artificial piece necessary at first, may easily be supposed, and is generally seen to attack the neighboring teeth; and they would be lost in turn, whether an artificial piece were used or not. Or, let us grant for a moment, that an artificial

piece, however well executed, is really apt to loosen a neighboring one to which it is fastened, in the space of five or six years; can the consideration of such a loss justly out-weigh all the obvious advantages of artificial teeth? or, is it a matter of great concern, if a man once in five or six years is obliged to have one added to the number of his artificial teeth?

The complaint, that the natural teeth are cut by the ligature which is used to fasten artificial ones, is owing to the fault of those who apply wire instead of silk. Ligatures of wire certainly hurt the natural teeth very soon, but silken twist cannot affect them in such manner, in the space of a great many years.

The use of artificial teeth is not confined to the cases where there are natural teeth to which they may be fastened. A whole set of artificial teeth may be made for one or both jaws, so well fitted to admit of the necessary motions, and so conveniently retained in the proper situation, by the help of springs of a new and peculiar construction, that they will answer every purpose of natural teeth, and can be taken out, cleaned, and replaced by the patient himself, with the greatest ease. I say springs of a peculiar construction, because they are totally different in shape and action from those which have been used by my predecessors; because they follow all the various motions of the jaw very freely; and because the pressure, which they give, is always equal and gentle, whether the mouth be shut or not.

When the gums are uneven or fallen away, the patient may have recourse to the use of *artificial* gums. This term sounds strangely, and makes no small show in an advertisement. But the contrivance is nothing more than an artificial set of teeth, carved, and stained at the lower edge, to represent the healthy gums. The deception is certainly good, and answers the purpose so well, that no body in common conversation can distinguish the *artificial* from the *natural* gums.

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